TOSHIBA

INSTALLATION &
OPERATING MANUAL

Digital Video Recorder

KV-HD01A

Before trying to connect or operate this product, please read this manual complete.

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SAFETY PRECAUTIONS

WARNING
RISK OF ELECTRIC SHOCK
DO NOT OPEN
AVIS
RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR
WARNING : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightening flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE A RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

FCC NOTICE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reason-able protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not in-stalled and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

WARNING: Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC rules.

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

UL This product is Classified by the Underwriters Laboratories Inc. Representative samples of this product have been evaluated by UL and meet the applicable UL Standards and requirements.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instruction.

In the spaces provided below, record the Model and Serial No. located on the rear panel of your Digital Video Recorder.

Model No. _____ Serial No._____

Purchase Date: _____ Dealer/Address/Phone: _____

Retain this information for future reference.

IMPORTANT SAFETY INSTRUCTIONS

Read the following safety precautions carefully before using the product. These instructions contain valuable information on safe and proper use that will prevent harm and damage to the operator and other persons. Make sure that you fully understand the following details (indications, graphic symbols) before proceeding to the main descriptions in this manual.

Indication definitions

Indication	Meaning
	This indicates that ignoring this label and/or misoperation of the product may cause serious personal injury or even death.
	This indicates that ignoring this label and/or misoperation of the product may cause personal injury *1 and/or material damage. *2

Graphic symbol definitions

Symbol	Meaning
	Indicates a prohibited action that must not be carried out. The actual prohibited action is indicated in the symbol or nearby graphically or described in text.
	Indicates a mandatory action that must be carried out surely. The actual mandatory action is indicated in the symbol or nearby graphically or described in text.

*1: Bodily injury means injuries, burns, and electric shock which does not require hospitalization or prolonged treatment.
*2: Physical damage means extended harm to home, household effects.

	• Do not use the product when abnormality occurs. The use in the abnormality status such as emitting smoke from the product, smelling burning, being damaged by drop, invasion of foreign objects inside the product, etc., may cause fire and/or electric shock. Be always sure to remove the AC adapter at once and contact your dealer.
	• Do not install the product near water – for example, near a bathtub, kitchen sink, laundry tub, wet basement, swimming pool, etc. This may cause fire and/or electric shock.
	• Do not repair, disassemble and/or modify yourself. Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
	• Use the AC adapter only with the indicated power supply voltage. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your location, consult your product dealer.
	• Do not put a vessel(s) filled with a liquid (flower vase, etc.). If a liquid enters the product, a fire and/or electric shock may occur.
	• Do not put the product in an unstable, slanting and/or vibrated place. Drop and/or fail of the product may cause injury.
	• Do not touch power or TV antenna cords during a thunderstorm. This might cause electric shock.

	• Observe the following when installing. • Do not put the product on an inflammable material such as carpet or blanket. • Do not put the product in a narrow space, since the heat generated from the product may be difficult to emanate. • Do not put an inflammable material on the product. If you do not follow above, the heat generated by the product may cause fire.
	• Do not put the product in direct sunshine and/or high temperature. The temperature rise inside the product may cause fire.
	• Do not put the product in a moist or dusty place such as a bathroom, a place close to a humidifier, etc. This may cause fire and/or electric shock.
	• Do not put the product in a moist, soot and/or dusty place such as a kitchen, etc. Do not put the product where a soot and steam may occur, such as a kitchen, etc., or in a dusty place. This may cause fire and/or electric shock.
	• Do not allow children to play with the packaging boxes, packaging bags, or other materials. Failing to do so may result in injury or suffocation.
	• Do not stand on the equipment. Doing so could cause it to crack, break, or could result in injury.
	• Ask your dealer to perform a periodical check and internal cleaning. Dust inside the product may cause fire and/or trouble. For check and cleaning cost, please consult your dealer.

DISCLAIMER

We disclaim any responsibility and shall be held harmless for any damages or losses incurred by the user in any of the following cases:

1. Fire, earthquake or any other act of God; acts by third parties; misuse by the user, whether intentional or accidental; use under extreme operating conditions.
2. Malfunction of non-function resulting in indirect, additional or consequential damages, including but not limited to loss of expected income and suspension of business activities.
3. Incorrect use not in compliance with instructions in this instruction manual.
4. Malfunctions resulting from misconnection to other equipment.
5. Repairs or modifications made by the user or caused to be made by the user and carried out by a unauthorized third party
6. Notwithstanding the foregoing, Toshiba’s liabilities shall not, in any circumstances, exceed the purchase price of the product.

IMPORTANT PRECAUTIONS

COPYRIGHTS

Using surveillance cameras to record certain images, and the subsequent publication, distribution or exhibition of such images, including, but not limited to, items in art exhibits, performing arts, photographs and printed materials, may require the permission of the owners of the rights to said images, subject to copyright law or other applicable laws.

Save Original Packing Materials

The original shipping carton and packing materials will come in handy if you ever have to ship your DVR. For maximum protection, repack the set as it was originally packed at the factory.

Daily or weekly Maintenance

Please sometimes check a recorded content.

Hard disks and Fans

In order to maintain recorded content and machine itself, and to prevent troubles, replacement of hard disks and fans in 3 years is the recommendation but not guarantee.

1. PRODUCT FEATURES

1.1 Product Introduction

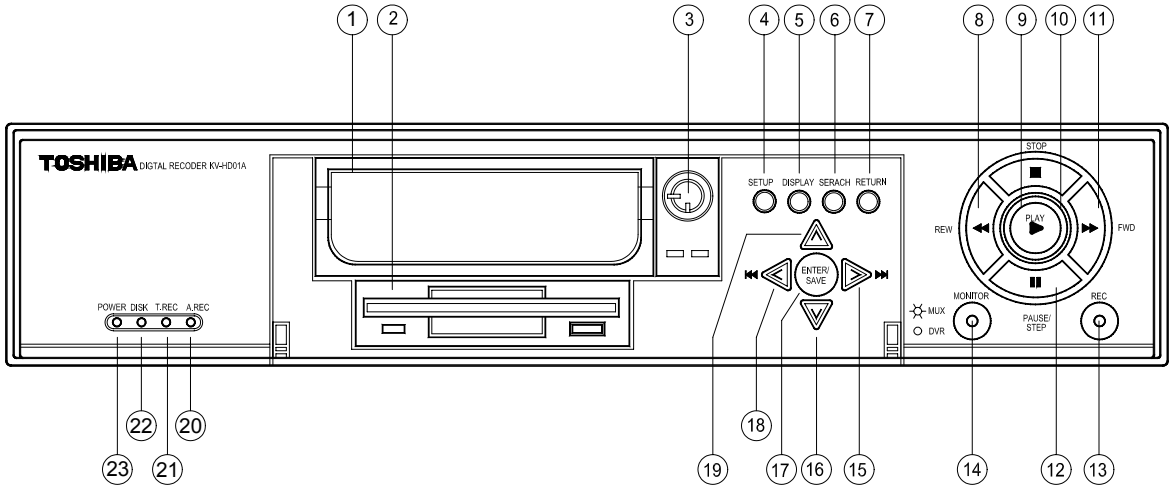
This DVR uses hard disk drives instead of VCR tapes to store digital video images. It enables you to enjoy the extreme flexibility of digital image archiving instead of clumsy tape management, and is absolutely compatible with most multiplexers in the market. Equipped with a wide range of comprehensive features, such as playback picture-by-picture, quick access video recording by time and event, the upgradeable software, the expandable capacities of the hard-disk drive, and much more, the DVR will make your applications far more flexible and effective than ever before. For everyone, this DVR is going to prove the timely substitute for Time-lapse VCR.

1.2 Product Features

- Stores video on hard disks instead of VCR tapes.
- Maximum 3 Hard Disks capability. (One removable)
- Hard disk hot-swapping capability
- Pre-alarm image recording
- Capable of working with various known multiplexers.
- Time-lapse and real-time recording.
- Refresh rate up to 60 FPS (50 FPS for PAL).
- Image quality selectable at 3 different levels for recording.
- Schedule/Manual/Alarm/Continuous recording mode.
- Quick search by time, alarm, event, and recording list.
- Fast and slow playback of recorded video at various speeds.
- Single-frame playback.
- On-screen main menu, title and system timer
- Password protection.
- Critical image archiving through 1.44 MB floppy drive.
- Disk-full warning and operation status LEDs.
- RS-232 communication port.
- Power interruption recovery.
- Operation-status record log.

2. DESCRIPTION OF THE FRONT/REAR VIEW

2.1 Front View



① **Hard-disk drive compartment.**

This compartment allows you to install a drive for backup purposes or additional storage. Make sure the drive is well secured with the mounting screws in the mobile rack before you put the rack into the compartment. And remember to turn on the power of the compartment by locking it.

② **1.44 floppy disk drive.** This 1.44 floppy disk slot is used for the system software updating and critical images archiving.

③ **Hard disk compartment lock:**

To secure a hard disk in place. Unlock this compartment before you remove the hard disk from the slot without turning off the device.

④ **SETUP** button:

Press this to enter the main menu. Press again to exit the setup mode.

⑤ **DISPLAY** button:

Push this to show the system operation status on the screen. (Please refer to section 3.3 for details)

⑥ **SEARCH** button:

Press this to enter the search mode for accessing recorded video.

⑦ **RETURN** button:

Press to leave the current setup page and return to the previous page.

⑧ **REV** button:

Press this to play a video in the reverse direction at faster or slower speeds than the recorded speed. Each subsequent press of the REV button increases or slows the rate.

⑨ **PLAY** button:

Press to play back a recorded video from the hard disk. While playing back the recorded video at faster or slower speeds than the recorded speed, press this button to return to the regular playback speed.

⑩ **STOP** button:

Press this to stop playing back a recorded video.

⑪ **FWD** button:

Press this to play a recorded video in the forward direction at faster or slower speeds than the recorded speed. Each subsequent press of the FWD button increases or slows the rate.

⑫ **PAUSE / STEP** button:

In a playback display, press this to freeze the display. During the freeze, press this to display one frame/field of a picture at a time in the forward direction.

⑬ **REC** button:

Push this to start recording the video into hard disks while in the live display mode.

⑭ ✱**MUX /** ●**DVR** button:

When connected to a multiplexer, press the MUX/DVR button to switch between the multiplexer decoded video and the encoded video to be displayed. When the button light is on it indicates the DVR is displaying the decoded video (The pictures are not multiplexing). In this mode, the unit doesn't display the OSD message of the unit on the screen. However, it doesn't affect the DVR's OSD message that is recorded into hard-disk drive. When the button light is off it indicates the DVR is displaying encoded video (The picture is switching swiftly).

⑱⑮ **Right / Left** buttons:

Press these two buttons to highlight desired items in the menu setup mode. For **Key Lock** operation, simultaneously press these two buttons once to lock the unit; to release **Key Lock**, simultaneously press these two buttons again.

⑲⑯ **Up / Down** buttons:

Press these two buttons to select the desired contents for programming in the menu setup mode.

⑰ **ENTER/SAVE** Button:

Press to enter the selected item and save the setting in the menu setup mode. During the playback of a video, if you wish to save a specific image to a floppy disk, press the PAUSE button to freeze the picture first and then press this button to save the image to a floppy disk.

⑳ **Indicator of Alarm Recording Mode:**

When the scheduled record setting is on, the indicator will light.

㉑ **Indicator of Timer Recording Mode:**

When the alarm record setting is on, the indicator will light.

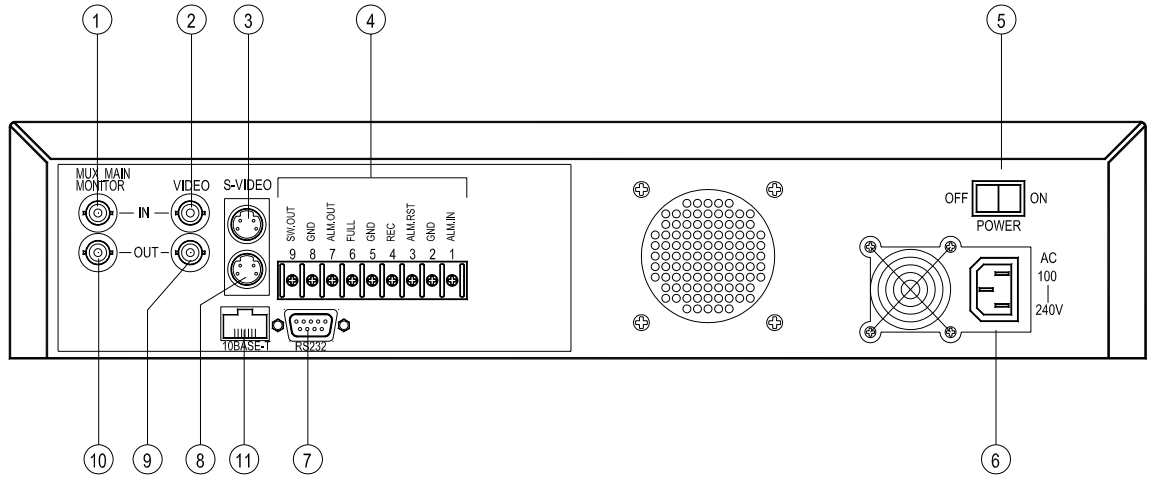
㉒ **Indicator of Hard Disk Status:**

Indicates the operation status of the hard-disk drives. Green light indicates the hard-disk drive is storing or retrieving the data. Red light signals the hard disk is reaching capacity.

㉓ **Power Indicator:**

Indicates the power status of the DVR.

2.2 Rear View



① **MUX MAIN MONITOR IN** Connector:

This BNC connector is used to connect the live video output from a multiplexer to the unit.

② **VIDEO IN** Connector:

This BNC connector is used to connect the video output from a camera or a multiplexer to the unit.

③ **S-VIDEO IN** Connector:

This connector is used to connect the S-video output from a camera or a multiplexer to the unit.

④ **Terminal Block:**

There are 9 exposure contacts on this terminal block including **SW. Out, GND, ALM. OUT, FULL, REC, ALM RST, GND,** and **ALM. IN** for connecting with external devices. Please refer to the next section for details.

⑤ **Power Switch:**

To power the unit on or off.

⑥ **Plug Outlet:**

For connecting with an external power supply.

⑦ **RS-232** Port:

RS-232 communication port for connecting with an external control device. Please refer to APPENDIX 1 for more details.

⑧ **S-VIDEO OUT** Connector:

This provides a S-video signal to a multiplexer.

⑨ **VIDEO OUT** Connector:

This provides a composite video signal to a multiplexer.

⑩ **MONITOR** Connector:

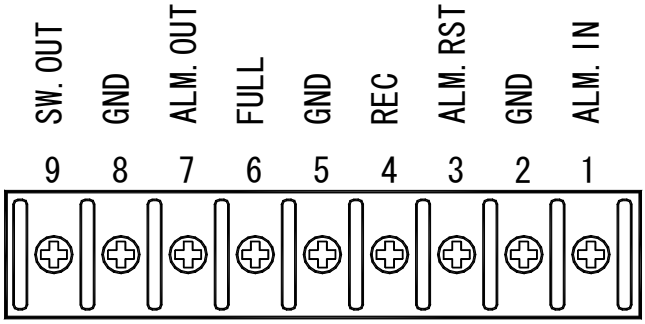
This provides a composite video or a multiplexer's live signal if connected to a display device.

⑪ **10 BASE-T** Connector:

This is a standard RJ-45 connector for 10 Mbps Ethernet networks.

NOTE: The DVR only processes the S-VIDEO IN signal when receiving video signals simultaneously from both "S-VIDEO IN ③" and "VIDEO IN ②" connectors.

2.3 Terminal Block



1. **ALM IN: (INPUT)**

   This is an alarm input, which can be programmed in the menu system to Normally Open or Normally Closed. (Active low, 5V)

2. **GND:**

   Ground Contact.

3. **ALM RST: (INPUT)**

   This terminal connects to an alarm-clear device for clearing the alarm. (Active low, 5V)

4. **REC: (INPUT)**

   This terminal connects an external switch to turn the recording function of the DVR on/off. (Active low, 5V)

5. **GND:**

   Ground Contact.

6. **FULL: (OUTPUT)**

   This terminal sends out the full-disk signal. (Active low, 5V)

7. **ALM OUT: (OUTPUT)**

   This is an alarm output relay. Connect this to an external device like buzzers or lights. (Active low, 5V)

8. **GND:**

   Ground Contact.

9. **SW OUT: (OUTPUT)**

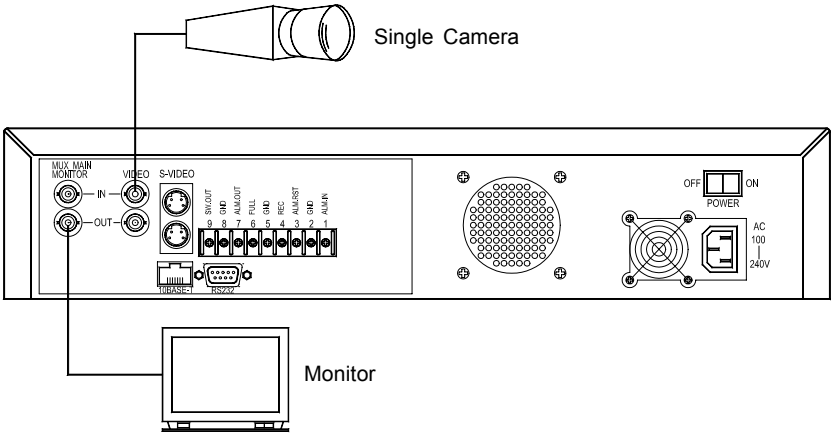
   This terminal, sending out the timing signal (falling/negative) to a multiplexer. Connect this terminal to a multiplexer's trigger terminal so that the multiplexer can switch to use the same recording speed as the DVR.

3. INSTALLATION

3.1 Basic Connection

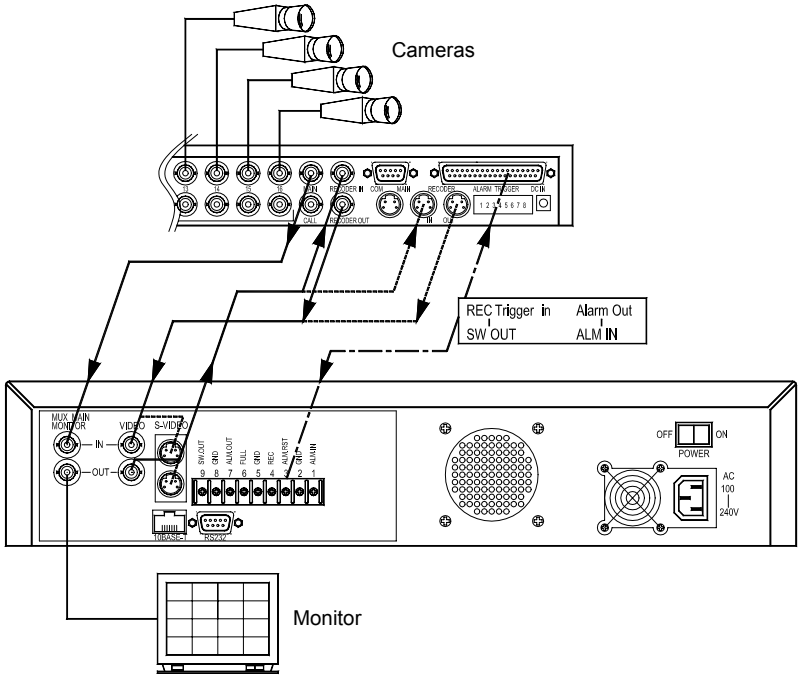
CONNECTING WITH A SINGLE CAMERA (OR A QUAD PROCESSOR)

Please set the **MULTIPLEXER** option to **OFF** on the **REC Setting page** in the main menu. (Please refer to section 5.3 MULTIPLEXER option)



CONNECTING WITH A MULTIPLEXER

To match the multiplexer's recording speed, please set the **MULTIPLEXER** option to **ON** on the **REC Setting page** in the main menu when the DVR is connected with a multiplexer. (Please refer to section 5.3 MULTIPLEXER option)



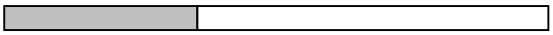
NOTE: The DVR only processes the S-VIDEO IN signal when receiving video signals simultaneously from both "S-VIDEO IN ③" and "VIDEO IN ②" connectors.

3.2 System Information

You can display system settings information as shown on **Table 3.2 A** below at any time by pressing the **DISPLAY** button⑤. However, when the unit is displaying a decoded image from a multiplexer, you must first switch the unit to encoded image displaying (The pictures is switching swiftly and the light of**✱MUX/●DVR** button⑭ is off) by pressing the**✱MUX/●DVR** button⑭. Each sequential press of the **DISPLAY** button displays a different message detailed in the following example. By default, the unit displays time, date, and an indicating bar of capacity status on a monitor as shown next.

Default display

(Capacity Used) (Capacity Remaining)



09- 05-2001 **16:13:02**

(Date) (System Time)

Press the **DISPLAY** button once; the unit will display the following sample message plus the default display. Press the **DISPLAY** button again; the unit will not display any OSD message. Press the button one more time to back to the default display.

Table 3.2 A.

HD 1+HD 2: 76G			**11.2 HR**
QUALITY: HIGH			**NTSC**
RATE: 6 HR			**20 F/S**
HD	**P**	**SIZE**	**POS**
1	**Y**	**38 G**	**2.5%R (P)**
2	**Y**	**38 G**	**0%R (P)**
3	**.**	**.**	

Description of Table 3.2 A

(HD1+HD2: 76GB): Total capacity of installed hard disk, 76 GB

(11.2 HR): Total 11.2 hour minimum guaranteed recording time available. Actual recording time may be longer in everyday use.

(⧖ **):** Timer record activated

(🔊 **):** Alarm record activated

(QUALITY: HIGH): Record quality setting, HIGH

(NTSC): NTSC system

(RATE: 6 HR): Setting of Record time mode, 6 hours

(20 F/S): Record speed setting, 20 fields/sec

(HD): Hard disk Compartment

(P): Y Hard disk installed; **.** No hard disk installed

(SIZE 38GB): The capacity of the installed hard disk

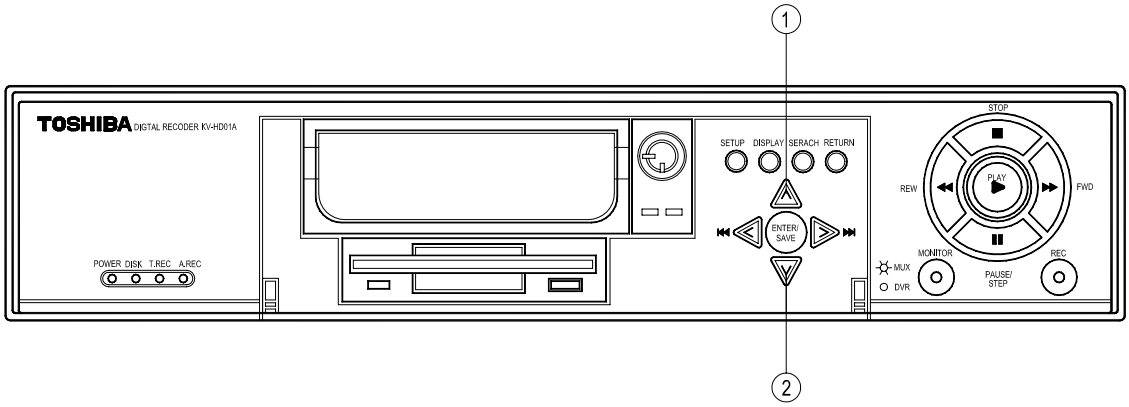
POS: Percentage of system; **R:** Recording; **P:** Playback

3.3 Updating System Software

If the system software of the unit needs to be upgraded, please take the following steps to safely update it.

Important: Before carrying out the following procedures, please ensure the floppy disk is working and the file of system software is intact (The size of the file should be up to 170 K.)

1. Turn off the unit.
2. Insert the floppy disk into the built-in floppy drive of the unit.
3. Hold down the △ and ▽ buttons simultaneously, and then turn on the unit.
4. Keep holding down the buttons until the unit sounds a tone and display the message " **SOFTWARE UPDATE**" and an indicating percentage of proceeding against a blue background on the screen. Now the unit is updating the system software, which will take approximately 90 seconds to process.
5. Restart the unit when the device sounds a tone twice and displays the message " **PLEASE RESTART**". The process is complete.
   (If you have already followed the procedure 1~5, the unit, however, is not being able to power on. Please first check if the floppy disk you are using is functioning and the file is intact. And then start the procedure 1 ~ 5 all over again.)
6. Verify the version of system software by entering main menu and then press ▷ and pause II buttons at the same time.



Warning: Don't Interrupt the process while the unit is updating itself and proceed with a floppy disk containing with no system software of the unit, which would cause the unit hang on.

3.4 Video format (NTSC/PAL) selection

If the video format (NTSC/PAL) of the unit needs to be changed, pleases take the following steps.

If the unit is currently set to NTSC;

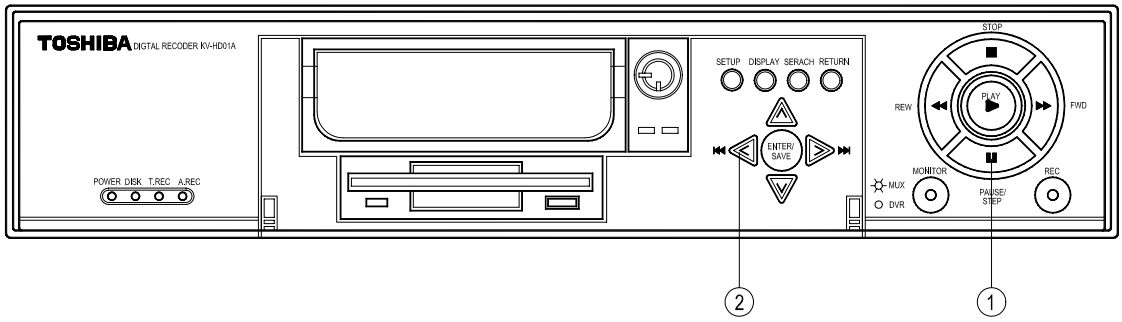
1, Push stop button.

2, Hold down the and pause buttons simultaneously.

3, OSD massage "SET PAL, PLS RESTART" appears.

4, Restart the unit. The video format is now set to PAL.

To revert back to NTSC, repeat process.



Note: Video recorded in PAL format will not playback on NTSC setting. Likewise video recorded in NTSC will not playback on PAL setting. It is recommended to reformat HDD after changing video format.

4. BASIC OPERATIONS

This section shows you how to operate and manage the unit when it gets in the way.

4.1 Configuring Recording Settings

Recording Time settings (Recording Rate and Picture Quality Setting)

Recording time will vary depending on the image size, recording rate, and the capacity of hard-disk drive. This unit ships with a 80GB hard disk for continuous recording from one to eight weeks under most recording conditions. The table below shows recording times based on the 80GB hard-disk drive at certain refresh rates and the corresponding image quality. With one or more hard-disk drives in operation, please calculate the recording time using the table below in accordance with your requirements. For a NTSC unit, for example, if the unit is set to record images with **HIGH** quality at a **60 fps** record rate, normally a 80GB hard-disk drive will be filled in 12 hours (See the gray area in the table). In a 2nd 80GB hard disk drive is added, under the same refresh rate and picture quality, both drives will be filled in 24 hours.

Set up the REC Time Mode when a multiplexer is connected

For optimum image recording and playback when a Multiplexer is used, the record speed of the multiplexer must be correctly adjusted to match the unit. Set the **MULTIPLEXER** option on the main menu to **ON**. This can be done one of the two methods detailed below.

(1) If an Toshiba multiplexer is connected for use, you can program the REC time mode of the multiplexer by referring to the table below (each refresh rate refers to one REC time mode).

(2) For a multiplexer other than Toshiba. Please, connect the SW. OUT terminal on the rear panel of the DVR to the multiplexer's trigger contact. The DVR will provide the timing signal (Negative/Falling) to the multiplexer. Thus, if the DVR changes the recording speed, the multiplexer will automatically adjust the record to match. The DVR doesn't provide a 2-hour timing signal in NTSC or 3-hour timing signal in PAL.

NTSC System

		Possible Recording Time HDD=80 Gigabytes									
Refresh Rate (Field/Sec)		60	20	10	5	2.5	1.25	0.625	0.25	0.16	0.125
Image Quality	**HIGH**	12 hr	36 hr	72 hr	144 hr	288 hr	576 hr	1008 hr	2880 hr	4320 hr	5760 hr
	STANDARD	18 hr	54 hr	108 hr	216 hr	432 hr	864 hr	1512 hr	4320 hr	6480 hr	8640 hr
	BASIC	24 hr	72 hr	144 hr	288 hr	576 hr	1152 hr	2016 hr	5760 hr	8640 hr	11520 hr
REC Time Mode		2 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr
REC interval (1/60 sec)		1	3	6	12	24	48	84	240	360	480

PAL System

		Possible Recording Time HDD=80 Gigabytes									
Refresh Rate (Field/Sec)		50	25	12.5	6.25	3.13	1.56	0.89	0.31	0.21	0.16
Image Quality	**HIGH**	14 hr	28 hr	54 hr	112 hr	224 hr	448 hr	784 hr	2240 hr	3360 hr	4480 hr
	STANDARD	22 hr	44 hr	88 hr	176 hr	352 hr	704 hr	1232 hr	3520 hr	5280 hr	7040 hr
	BASIC	28 hr	56 hr	112 hr	224 hr	448 hr	896 hr	1568 hr	4480 hr	6720 hr	8960 hr
REC Time Mode		3 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr
REC interval (1/50 sec)		1	2	4	8	17	32	57	161	241	321

4.2 Recording Operations

This section details the way to record video into hard-disk drives. Before commencing with the recording function, please configure the recording setting properly according to your needs.

4.2.1 Manual Recording

When the unit is in the live display mode, take the following steps to start recording:

(1) In live display, press the **REC** button 13 to record video onto a hard disk drive with the corresponding programmed recording settings. The monitor should display a flashing **REC** message and the **REC** button will light up indicating the unit is in the recording status.

(2) Press the **STOP** button 10 to stop recording any time.

(3) To access just recorded video, please refer to section 4.4 for more details.

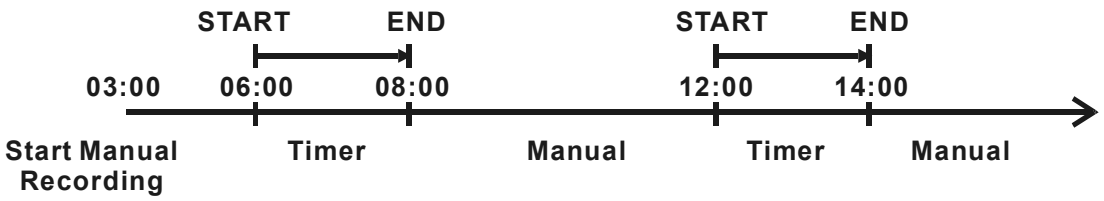
4.2.2 Timer Recording

Timer recording provides two periods of time each day in a weekly table which programs the DVR to turn on and off at specified times. This way the DVR will start and stop recording according to the programmed schedule. Please take the following steps to program the scheduled recording.

(1) Press the **SETUP** button ④ to enter the **MAIN MENU**.
(2) Select the **RECORD TIMER** and press the **ENTER/SAVE** button ⑰ to enter the **TIMER** page**.**
(3) Select the **TIMER-SET**.
(4) Press the ENTER/SAVE **ENTER/SAVE** button ⑰ to enter the **REC SCHEDULE** table.
(5) Use the ◁ button ⑱ and the ▷ button ⑮ to locate the specific day/hour/minute and use the △ button ⑲ and the ▽ button ⑯ to set the day/hour/minute you wish. The time is displayed in a 24-hour clock format.
(6) After scheduling is completed, press the ENTER/SAVE **ENTER/SAVE** button ⑰ and set **OK** to save the setting or select **CANCEL** to leave the page without saving the settings.
(7) To activate the programmed recording schedule, set the **REC ENABLE** to **ON**. As the scheduled recording is on, the red indicator of the Timer Record will be on as well. To deactivate it, set to **OFF**.
(8) Press the **STOP** button ⑩ during the scheduled recording to stop it at any time. If you wish to continue the scheduled recording, press the **REC** button ⑬ to proceed.

NOTE: You can proceed to start the scheduled recording from the current time if it is in the scheduled interlude as soon as setting is completed. Press the REC button to proceed.

NOTE: If you activate the recording function before the scheduled recording, the unit will operate recording as showed the diagram below and keep those Image in different files.



MAIN MENU

TIME/ TITLE
RECORD TIMER
RECORD
ALARM
COMMUNICATION
DISK
SYSTEM

GO TO TIMER PAGE

⇩

RECORD TIMER

REC ENABLE
TIMER---------- SET

MAIN PAGE

SET REC TIMER

⇩

REC SCHEDULE

START END	START END
S : 00-00:00-00	00:00-00:00
M: 00-00:00-00	00:00-00:00
T : 00-00:00-00	00:00-00:00
W: 00-00:00-00	00:00-00:00
T : 00-00:00-00	00:00-00:00
F : 00-00:00-00	00:00-00:00
S : 00-00:00-00	00:00-00:00

←→ TO MOVE ↑↓ TO CHANGE

MAIN MENU

TIME/ TITLE
RECORD TIMER
RECORD
ALARM
COMMUNICATION
DISK
SYSTEM

GO TO TIMER PAGE

⇩

RECORD TIMER

REC ENABLE---------- ON
TIMER

MAIN PAGE

TIMER REC ENABLE

4.2.3 Alarm Recording

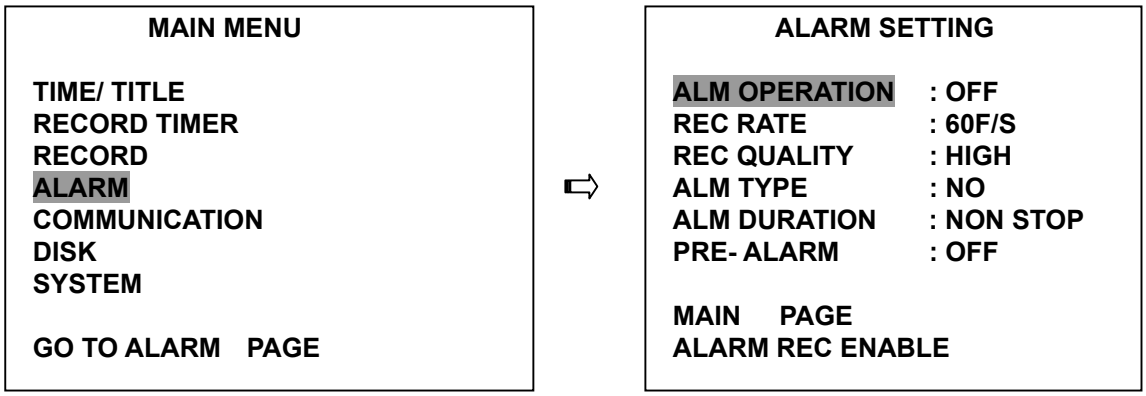
Take the following steps to activate the programmed alarm recording. For **ALM REC RATE**, **ALM REC QUALITY**, **ALARM STATUS**, **ALM DURATION**, and **PRE-ALARM** settings, please refer to section 5.4 for more details.

(1) Press the **SETUP** button (4) to enter the **MAIN MENU**.

(2) Select **ALARM** and press the ENTER/SAVE **ENTER/SAVE** button (17) to enter the **ALARM SETTING**.

(3) Set the desired **REC RATE, REC QUALITY, ALM TYPE,** and **ALM DURATION** for use. If pre-alarm recording is required, set **PRE-ALARM** to **ON**.

(4) To activate the alarm recording, set **ALARM OPERATION** to **ON**. To deactivate it, set **ALARM OPERATION** to **OFF**.

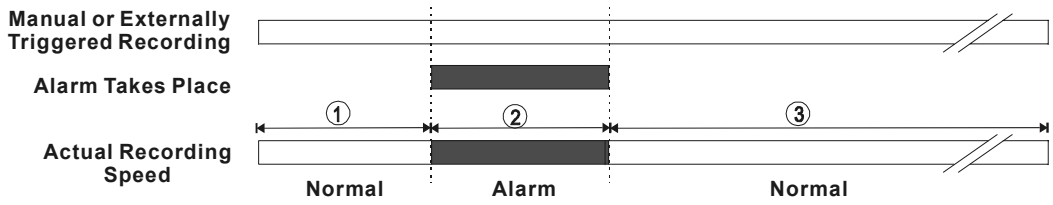


4.2.4 Externally triggered Recording

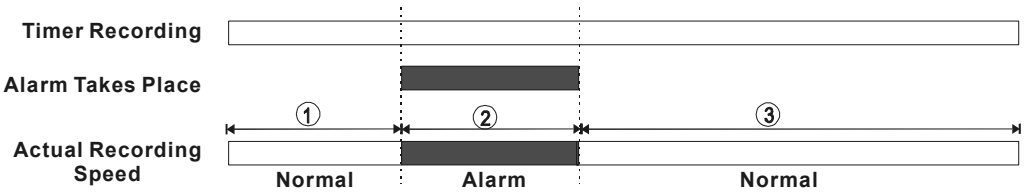
You can use an external switch to turn the recording function of the DVR on/off to record video into the hard-disk drive by connecting the **REC** exposure contact on the rear panel of the DVR. Please refer to section 2.3 for more details.

NOTE: The status of recording operations as showed the diagrams below when an alarm takes place.

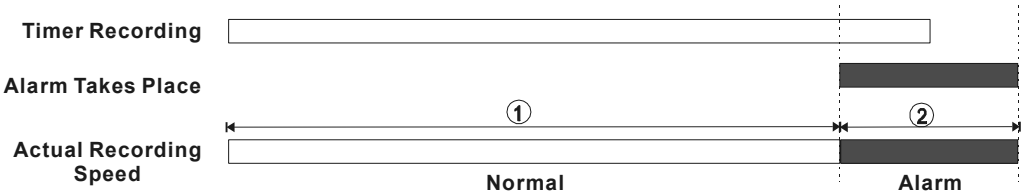
1



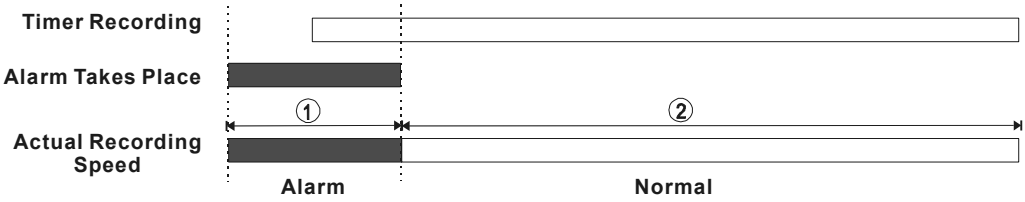
2



3



4



4.3 Playback Operations

This section shows you how to operate the fast, slow, and single-picture playback functions, and details how the unit is to playback a file in different operation status. Please refer to the following paragraphs specifying the relevant details. When playing a file, the monitor should display a flashing **PLAY** message and the ▷ **PLAY** button ⑨ will light up indicating that the unit is in the playback status.

Operation Status

A. From REC mode to Playback mode

(In live mode, directly press "PLAY" button to play a latest recorded video)

REC→ [Stop] → [Play] ..... Play the latest recorded file

- ▶ [Play: to the end of the file] ..... Show the ending message (Using search function to replay the file if required)
- ▶ [Stop] → [Play] ..... Play the file from the stop position

B. Search to play back a particular recorded video

Search→ [Play] ..... Play a selected file

- ▶ [Play to the end of the file] ..... Show the ending message (Search again to replay the file if required)
- ▶ [Stop] → [Play] ..... Play the file from the stop position

C. Play Back From The Oldest Data

[Stop: Press the "STOP" button for three seconds] → [Play] ..... play back the oldest recorded video

4.3.1 Fast Forward/Reverse

There are 5 speeds available for playback: 2x, 4x, 8x, 16x, and 30x.

While playing back recorded video at recorded speed:

Forward: Press the ▷▷ **FWD** button ⑪ to view the recorded video in the forward direction at a speed faster than the recorded speed. Each subsequent press of the ▷▷ FWD button increases the rate.

Reverse: Press the ◁◁ **REV** button ⑧ to view the recorded video in the reverse direction at a speed faster than the recorded speed. Each subsequent press of the ◁◁ **REV** button ⑧ increases the rate.

Normal: Press the ▷ **PLAY** button ⑨ to return to the normal speed of playback.

NOTE: The playback speed will be displayed on the screen. However, when playing a recorded video from a multiplexer, the playback speed only display on encoding (multiplexing) mode. Press the ✱MUX / ●DVR button to switch between decoding and encoding mode.

4.3.2 Slow Forward/Reverse

There are 4 speeds available for a slow playback: 1/2, 1/4, 1/8, 1/16. Follow the instructions below to proceed with a slow playback.

While playing back recorded video at the recorded speed:

(1) Press the **PAUSE/STEP** button ⑫ for the slow playback mode.

(2) **Forward:** Press the **FWD** button ⑪ to view the recorded video in the forward direction at a speed faster than the recorded speed. Each subsequent press of the **FWD** button slows the rate.

(3) **Reverse:** Press the **REV** button ⑧ to view the recorded video in the reverse direction at a speed faster than the recorded speed. Each subsequent press of the **REV** button slows the rate.

(4) **Normal:** Press the **PLAY** button ⑨ to return to the normal speed of playback.

4.3.3 Play Back Picture-by-picture

While playing back recorded video at the recorded speed:

(1) Press the **PAUSE/STEP** button ⑫ for the picture-by-picture mode.

(2) Press the **PAUSE/STEP** button ⑫ to display one frame/field of a picture at a time in the forward direction. **(When playing back recorded video recorded by a multiplexer, each sequential press of the PAUSE/STEP button ⑫ will display each camera in sequence.)**

(3) Press the **PLAY** button ⑨ to return to the normal speed of playback.

NOTE: A flickering condition of an image occurs while playing back picture-by-picture, please set the FLICKER REDUCTION option to ON in the SYSTEM page of the main menu. However, when this function is activated, a slight loss of picture quality may occur.

4.3.4 Play Back Recorded Video from a HDD of the mobile rack

To play back a recorded video from a HD3, take the following steps:

(1) Press setup button to enter the main menu.

(2) Select **DISK** and press the ENTER/SAVE **ENTER/SAVE** 17 button to enter **DISK SETTING** page.

(3) Set the **HD3 USAGE** to **REC/PLAY** and then exit the main menu.

(4) Use the Search function to access desired recorded video. Specific operation details please refer to the next section 4.4 Search Operations.

4.4 Search Operations

This section shows you how to access recorded video.

4.4.1 Full List Search

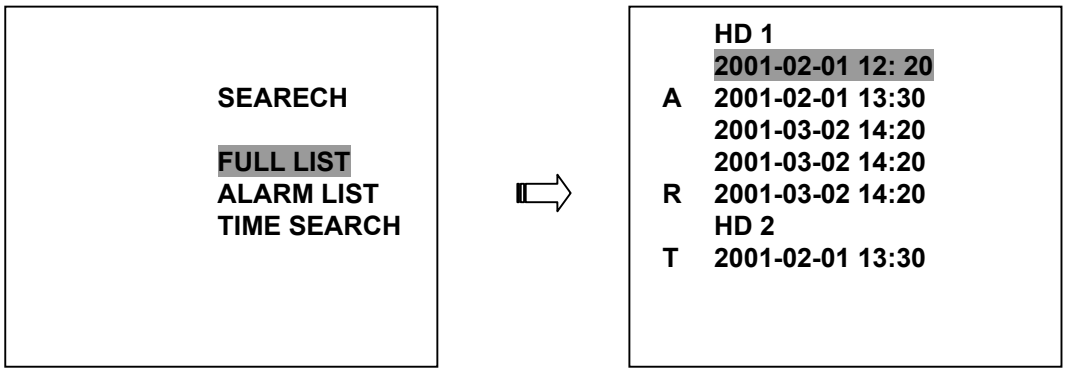
Take the following steps to proceed with the full list search function.

(1) Press the **SEARCH** button 6 to enter the search mode.

(2) Select the **FULL LIST** and press the ENTER/SAVE **ENTER/SAVE** 17 button to access the complete list of recorded video.

(3) Highlight the specific recorded video of your requirement and press the ENTER/SAVE **ENTER/SAVE** button 17 to display the selected video.

(Key Operation: Press △▽ Up/Down buttons 19 16 to select a video; Press ◁ ▷ Right / Left buttons 18 15 to flip over a page.)



NOTE: T: Timer recording; R: External trigger recording; A: Alarm recording.

4.4.2 Alarm list Search

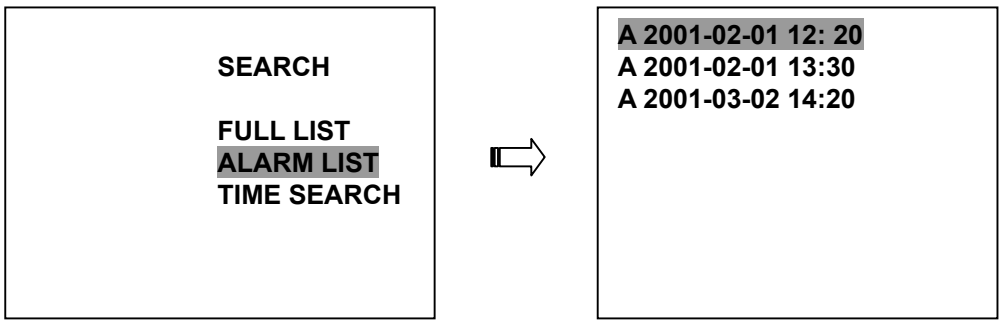
Take the following steps to proceed with the alarm list search function.

(1) Press the **SEARCH** button ⑥ to enter the search mode.

(2) Select the **ALARM LIST** and press the ENTER/SAVE **ENTER/SAVE** button ⑰ to access the complete list of alarm-event recorded video.

(3) Highlight the specific recorded video of your requirement and press the ENTER/SAVE **ENTER/SAVE** button⑰ to display the selected video.

(Key Operation: Press △▽ Up/Down buttons ⑲⑯ to select a video; Press ◁ ▷ Right / Left buttons ⑱⑮ to flip over a page)



4.4.3 Time Search

Take the following steps to proceed with the alarm list search function.

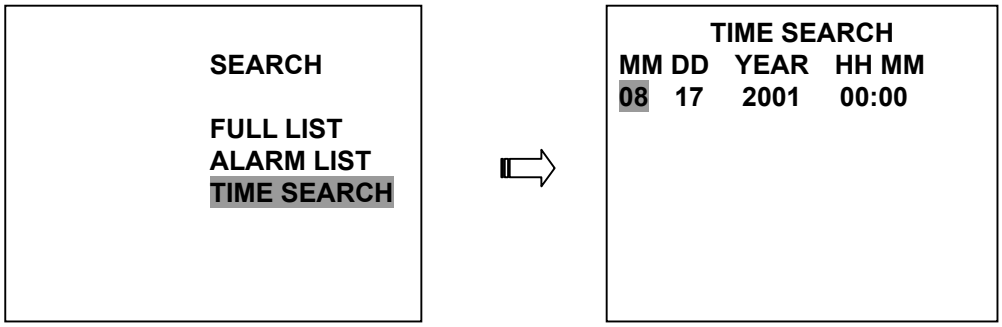
(1) Press the **SEARCH** button ⑥ to enter the search mode.

(2) Select the **TIME SEARCH** and press the ENTER/SAVE **ENTER/SAVE** button ⑰ to access the time setting page.

(3) Set the time period you wish to search for the recorded video.

(4) Press the ENTER/SAVE **ENTER/SAVE** button ⑰ to start searching and displaying the concerned image.

(5) If no video is found, please return to the time setting page and repeat steps (3) and (4) again for another search.



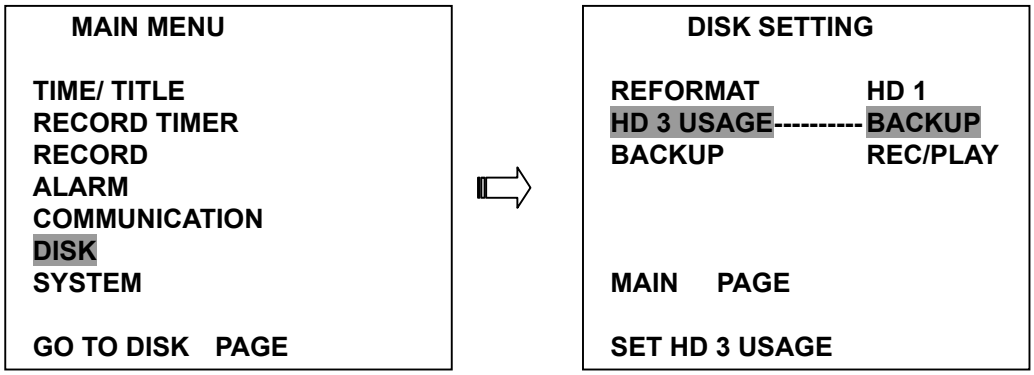
4.5 Data Backup

4.5.1 Backup Operations

There are three ways available to duplicate the recorded video from HD 1 and HD 2 to HD 3.
Please take the following steps to proceed.

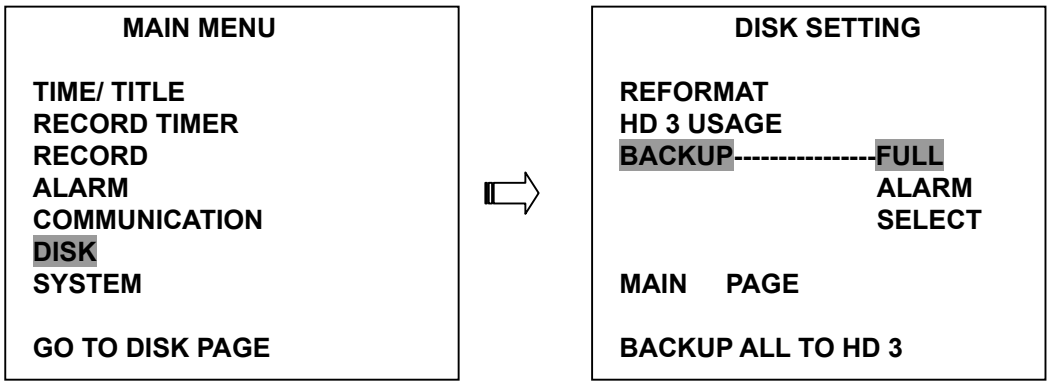
(1) Set HD 3 to BACKUP first. Take the following steps.

- Press the **SETUP** button ④ to enter the setup mode and select the **DISK**.
- Highlight **DISK** and press the ENTER/SAVE **ENTER/SAVE** button ⑰ to enter the **DISK SETTING** page.
- Then set **HD 3 USAGE** to **BACKUP**.



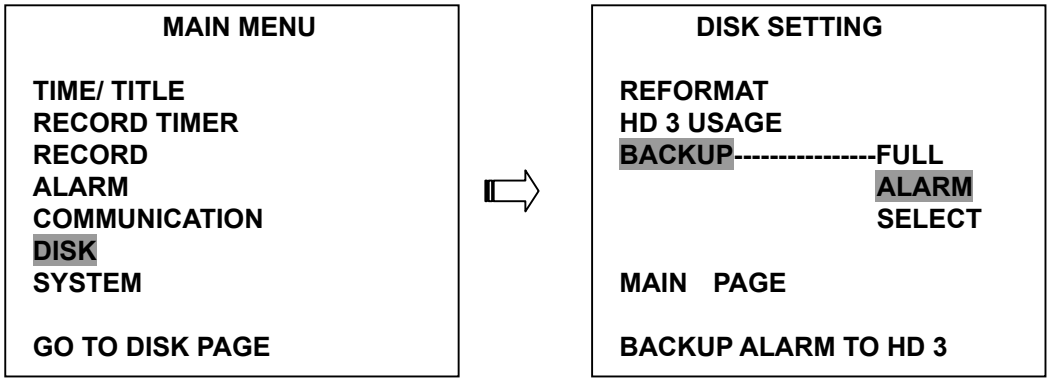
(2) FULL: Duplicating all the recorded video from HD1 and HD 2 to HD3.

- Stay on the **DISK SETTING** page.
- Use the △▽ **Up/Down** buttons ⑲⑯ to highlight **BACKUP**; select **FULL,** then press the ENTER/SAVE **ENTER/SAVE** button ⑰ to proceed.



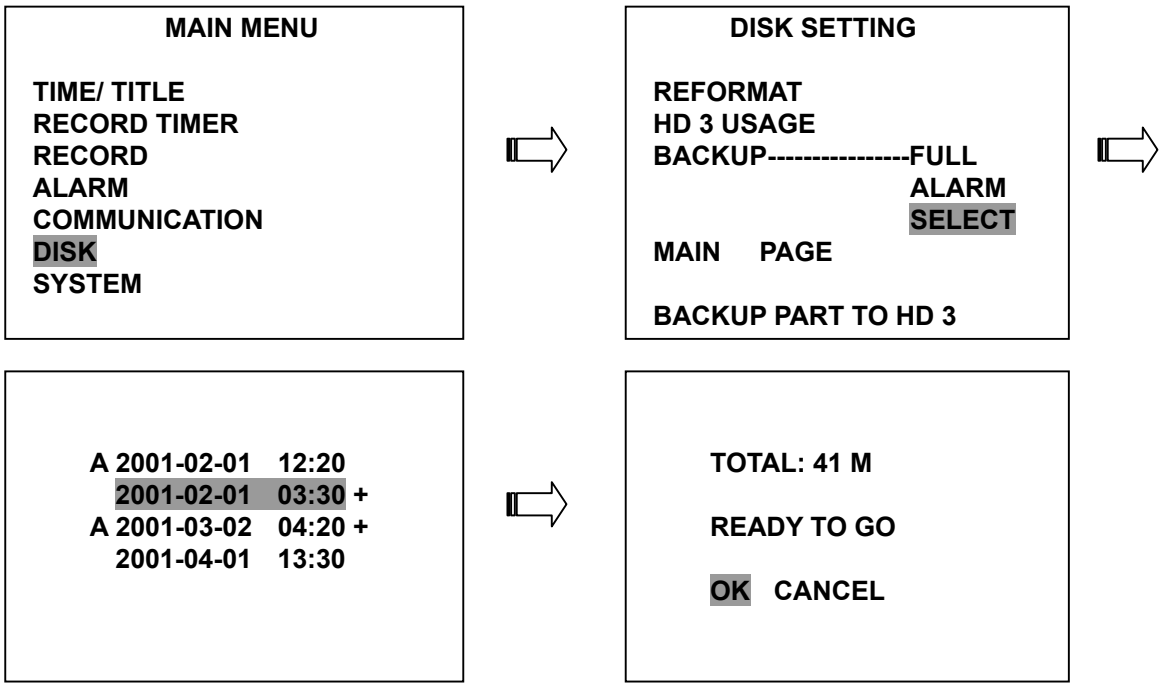
ALARM: Duplicating all the alarm-event recorded video from HD 1 and HD 2 to HD 3.

- Stay on the **DISK SETTING** page.
- Use the △▽ **Up/Down** buttons 19/16 to highlight **BACKUP**; select **ALARM,** then press the ENTER/SAVE **ENTER/SAVE** button 17 to proceed.



SELECT: Duplicating a particular recorded video from HD1 and HD 2 to HD3.

- Stay on the **DISK SETTING** page.
- Use the △▽ **Up/Down** buttons 19/16 to highlight **BACKUP,** select **SELECT** and then press the ENTER/SAVE **ENTER/SAVE** button 17 to list all the recorded video.
- Press the △▽ **Up/Down** buttons 19/16 to select the desired clip and press the **SETUP** button to mark it.
- After completing the selection, press the ENTER/SAVE **ENTER/SAVE** button 17 to proceed.



NOTE: If the capacity of HD 3 is not sufficient to store all selected video, a warning message "HD3 SPACE NOT ENOUGH" will be displayed on the screen. Please, insert a larger capacity of hard disk drive or erase some data from the drive and start the process over again.

4.5.2 Archive Clips into Floppy Disk

Please take the following steps to archive a critical image in a floppy disk.

(1) Insert a 1.44 floppy disk into the floppy slot.

(2) Start playing back the recorded video. (When playing back recorded video made by a multiplexer, you must to get into the multiplexing mode and display picture by picture to be able to select the desired image for archiving. Press the **✱MUX/●DVR button** ⑭ to get into the multiplexing mode under this mode that the light of **✱MUX/●DVR** button is off and the pictures is switching swiftly)

(3) Press the **PAUSE/STEP** button ⑫ to freeze the desired pictures.

(4) Press the **ENTER/SAVE** button ⑰ to save the image in the floppy disk.

(5) A floppy disk can store approximately 50~100 pictures. You can have the saved images printed out in any computer. The image is stored in the JPEG compressed format. If more than one clip is stored in a floppy disk, file names will be assigned in sequence as shown below.

SAVE TO J0001.JPG

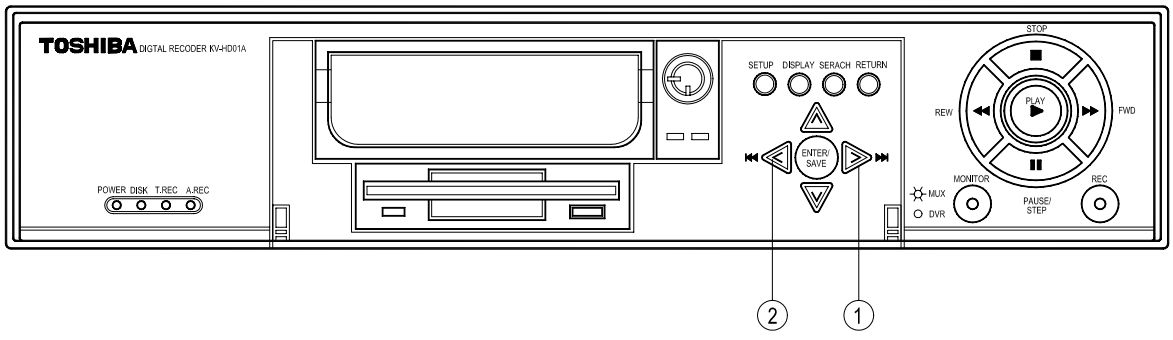
SAVE TO J0002.JPG

…

SAVE TO J000N.JPG

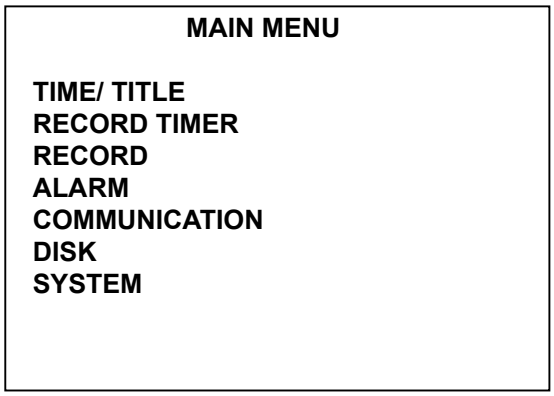
4.6 Key Lock Operation

The Key lock operation protects the unit against unauthorized use by disabling the entire front panel control. Simultaneously press these two ① and ② buttons (as shown below) once to lock the unit; to release **Key Lock**, simultaneously press these two buttons again.



5. MAIN MENU

There are 7 submenus to the MAIN MENU to guide you through the setup of the DVR. The following sections will instruct you step by step now to configure the operation setting and options. Press the **SETUP** button ④ to access the MAIN MENU. Once inside the menu system, the on-screen menu allows you to set up the key features of the unit. The functions of various buttons within the Main Menu mode are described in the paragraphs below.



KEY FUNCTIONS

SETUP button ④ :

Press to enter the main menu. Press again to exit the setup mode.

RETURN button⑦ :

Press to exit the current setup page and return to the previous page.

Right/Left buttons ⑱⑮ :

Press to select the desired item or entry for the setting.

Up/Down buttons ⑲⑯ :

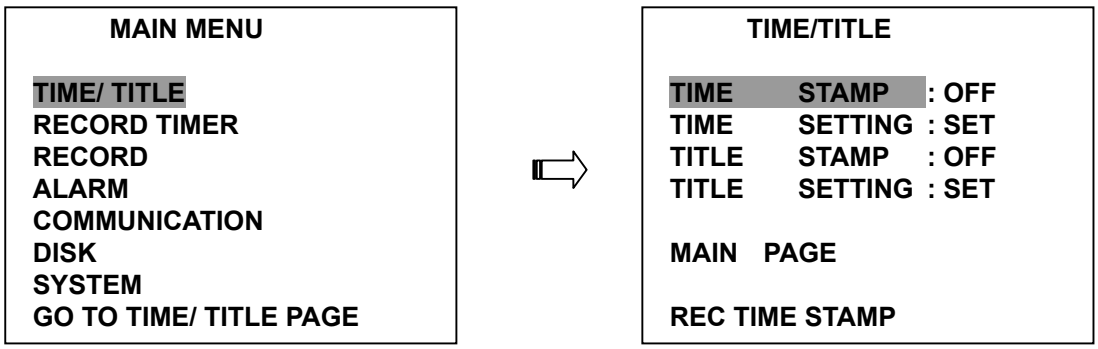
Press to highlight the desired option or to select the context for the setting.

ENTER/SAVE button ⑰ :

Press to enter the selected item and to save the settings.

5.1 TIME/ TITLE

This device is able to print inerasable system time and title information directly onto images during recording. This page allows users to set the time and desired title, and to decide if the function is to be activated. The entries are listed as follows.



TIME STAMP :

The Time Stamp option is used to stamp the system time onto images during recording process. The Time Stamp is inerasable.

ON : Enables the device to stamp the time onto images during recording.

OFF : Disables the stamping function.

TIME SETTING :

This option is used to set the system time and date.

TITLE STAMP :

The Title Stamp option is used to stamp the system title onto images during the recording process. The Title Stamp is inerasable.

ON : Enables the device to stamp programmed title onto images while recording.

OFF : Disables the stamping function.

TITLE SETTING :

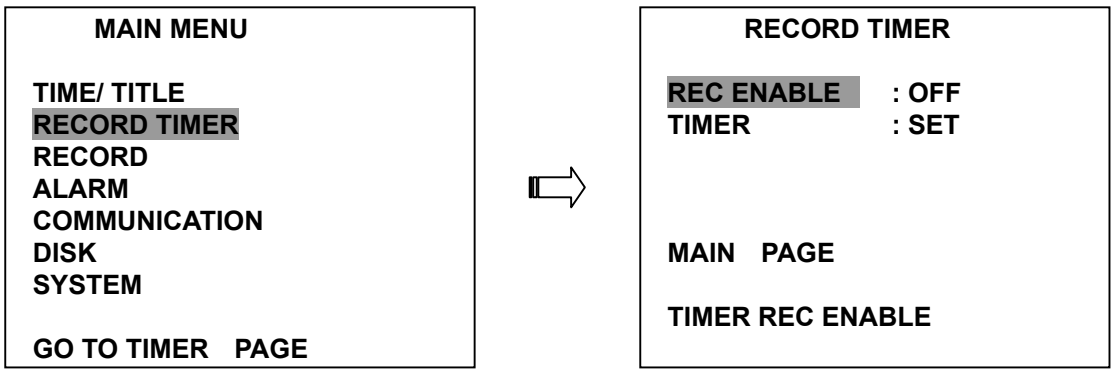
This option is used to set the system title. The Title can consist of up to twelve characters with the letters A-Z, numbers 0-9 or blank spaces.

NOTE: If you wish to have system-time on an archived image in a floppy, the "TIME STAMP" option must be set to "ON" for recording.

NOTE: No matter whether the "TIME STAMP" option is set to "ON" or "OFF", the unit will always encode the system time into the video while recording. So you can always have system time to be displayed on the screen by pressing the "DISPLAY" button. However, if two time messages have overlapped on the screen, please press the "DISPLAY" button to stop decoding time from the video so that the unit will only display the stamped time only.

5.2 RECORD TIMER

The unit provides a weekly table, consisting of two periods of time each day for scheduled recording. This option allows you to set the time each day that the unit will start and stop recording.



REC ENABLE :

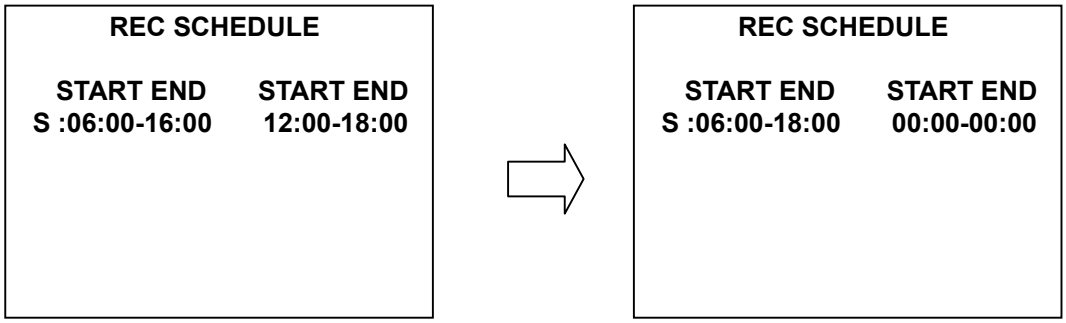
The rec enable option is used to enable / disable the programmed scheduled recording.

ON: Enables the scheduled recording.

OFF: Disables the scheduled recording.

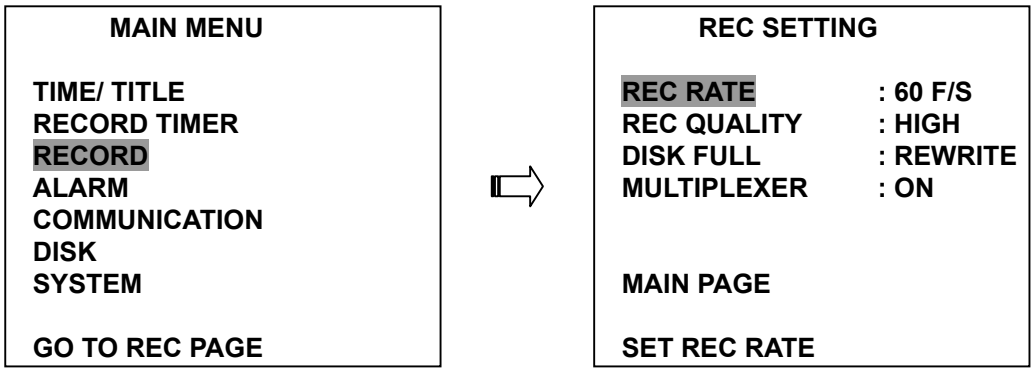
TIMER :

This option is used to set the time that the unit will start and stop recording each day in a weekly format. There are two time periods each day available for scheduling. The time is displayed in a 24-hour clock format. If there is a time overlap between two continual time period settings, the device will automatically combine the two time-period settings into one combined time period setting.



5.3 REC SETTING

This page allows you to set recording rate and recording quality, and to enable you to continue recording when the disk is full.



REC RATE:

This option is used for adjusting the number of pictures recorded every second into a hard disk. The recording rate controls the frequency at which the number of video pictures can be recorded. For a NTSC unit, there are 10 different recording rates you can select from: **60F/S (60 fields per second), 20F/S, 10F/S, 5F/S, 2.5F/S, 1.25F/S, 0.625F/S, 1 F/4S, 1F/6S,** and **1F/8S.** For a PAL unit, there are two different sets of recording rates for use with a camera or a multiplexer, respectively. Please refer to the table in section 4.1 for details.

REC QUALITY:

This option is used to determine the quality of the image being recorded. There are 3 levels of image quality you can select from: **HIGH, STANDARD,** and **BASIC.** Selecting HIGH image quality will result in higher-resolution recorded images, and will normally take up more storage space than a STANDARD or BASIC quality image does.

DISK FULL:

This option is used to determine the way to utilize storage media in the case that the specified hard disk is full.

REWRITE: When the hard disk drive is full, the device continues recording by displacing the old data.

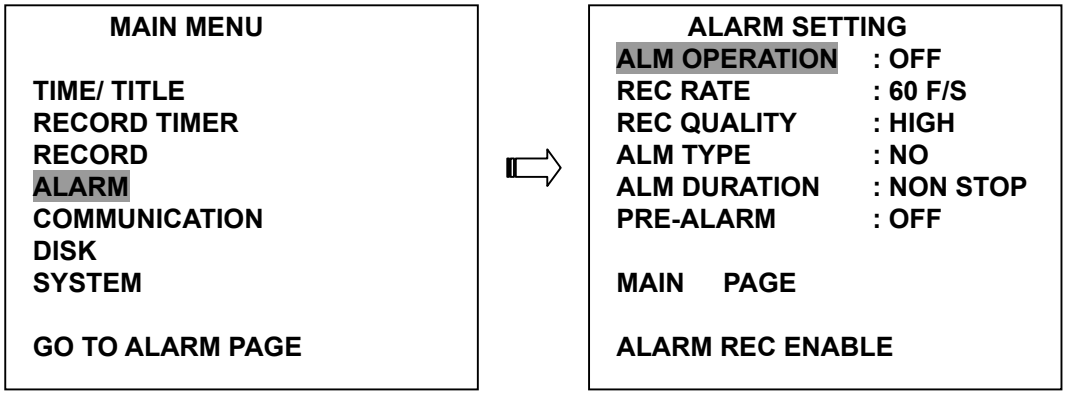
STOP: When the hard disk drive is full, the device will stop recording.

MULTIPLEXER:

For optimum image recording please set this option to **ON** when the unit connected with a multiplexer for use. Set this option to **OFF** when only it is connected with a single camera.

5.4 ALARM SETTING

This menu allows users to program the configuration of alarm recording only when an alarm input is activated. The device will record as long as the alarm input is activated.



ALM OPERATION:

The ALM OPERATION option is used to determine whether to activate/deactivate the alarm recording when it detects an alarm input.

ON: The device activates the alarm recording when it detects an alarm input.

OFF: The device ignores the alarm signal when it detects an alarm input.

REC RATE:

The REC RATE option is used for adjusting the number of pictures recorded every second into a hard disk when an alarm input is activated. For a NTSC unit, there are 5 different record speeds you can select from: **60F/S (60 fields per second), 20F/S, 10F/S, 5F/S,** and **REMAIN.** And for a PAL unit, there are 5 different record speeds you can select from: **50F/S (50 fields per second), 25F/S, 10F/S, 6.25F/S** and **REMAIN.** If you select **REMAIN** for use, the device will record images at the same speed as set on the **REC** page.

REC QUALITY:

The REC QUALITY option is used to determine the quality of the image being recorded. There are 3 levels of image quality you can select from **HIGH, STANDARD,** and **BASIC.** Selecting **HIGH** image quality will result in higher-resolution recorded images, and will normally take up more storage space than a **STANDARD** or **BASIC** quality image does. The table below shows the level of image quality with the corresponding compression ratio and image size.

ALM TYPE:

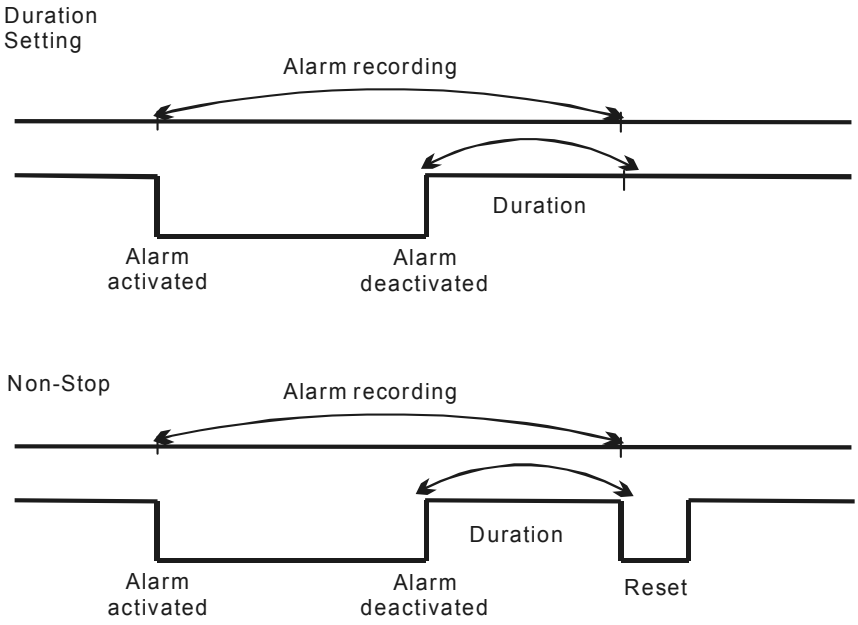
The ALM TYPE option is used to set a type of alarm input corresponding to the sensor signal in use.

NO: Normally Open. This is to be used with the type of alarm sensor, whose contact remains open in normal conditions and closes in case of activation.

NC: Normally Close. This is to be used with the type of alarm sensor, whose contact remains closed in normal conditions and opens in case of activation.

ALM DURATION:

The ALM DURATION option is used to set the alarm record mode to record for a certain duration after the alarm has been deactivated. You can select one of the six following options: **0 SEC, 30SEC, 1 MIN, 5 MIN, 10 MIN,** and **NON-STOP.**



PRE- ALARM:

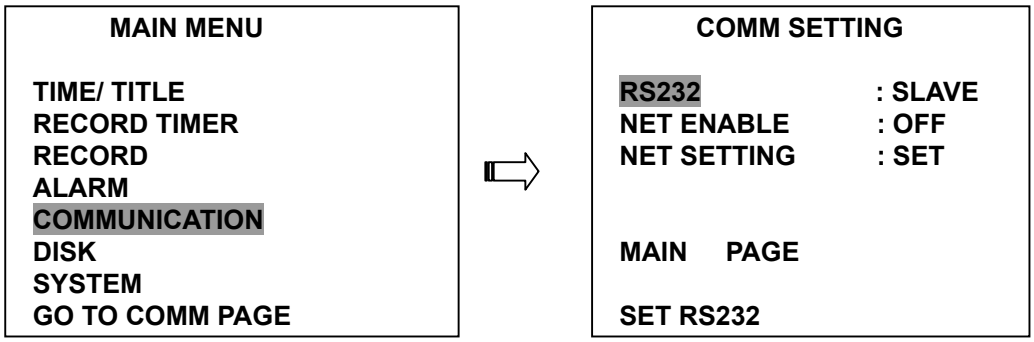
The PRE-ALARM option is used to determine that images prior to an alarm will be recorded into the hard-disk drive. If the alarm-recording rate is set to 60F/S, when an alarm is being triggered the device will record the image prior to the alarm for 3 seconds. If one of the other alarm-recording rates is set, the pre-alarm image recording will be extended to 5 seconds.

ON: Enables pre-alarm recording.

OFF: Disables pre-alarm recording.

5.5 COMMUNICATION

The COMMUNICATION option is used to configure status of the communication port when the connected with an external device.



RS232:

The RS232 option is used to determine the activation/ deactivation of the RS232 communication port for externally triggered recording. To record video into the hard-disk drive connect the **REC** exposure contact on the rear panel of the DVR to the switch used to activate the alarm.

MASTER: Sets the KV-HD01A as the master device.

SLAVE: Sets the KV-HD01A as the slave device.

NET ENABLE is used to allow remote users viewing privileges over a network or IP.

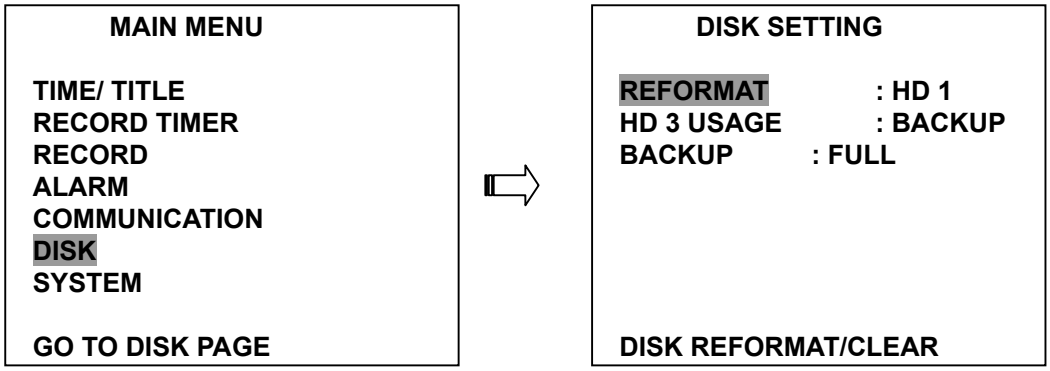
OFF: Ethernet capability is turned off

ON: Ethernet capability is turned on

NET SETTING is used to set the IP, MASK, and GATEWAY address of the KV-HD01A.

SET: Sets the IP,MASK, and GATEWAY addresses of the KV-HD01A

5.6 DISK SETTING



REFORMAT:

The REFORMAT option is used to clear out all of the data in the hard disk drive. You will be required to enter the pre-set password before proceeding with clearing out the data. Enter the standard password “9999” if you don’t set your individual password. To set your individual password, please refer to section 5.7 **PASSWORD** option.

HD 1 : Deletes all of the data stored in HD 1.

HD 2 : Deletes all of the data stored in HD 2.

HD 3 : Deletes all of the data stored in HD 3.

HD 1 2 : Deletes all of the data stored in HD 1 and HD 2.

HD 1 3 : Deletes all of the data stored in HD 1 and HD 2.

HD 12 3 : Deletes all of the data stored in HD 1, HD 2 and HD 3.

BACKUP HD : Deletes all of the data stored in HD 3, which is set to backup purpose only. (This function has to be proceeded when the **HD 3 USAGE** option is set to **BACKUP**.)

HD 3 USAGE:

The HD 3 USAGE option is used to determine the way to utilize the hard disk drive in the mobile compartment HD 3.

BACKUP : Used for data backup only, which will not be part of regular recording hard disk drive.

REC/ PLAY : Used for regular recording hard disk drive.

Note: When you wish to play back a recorded video from HD3, this option must be set to REC/PLAY.

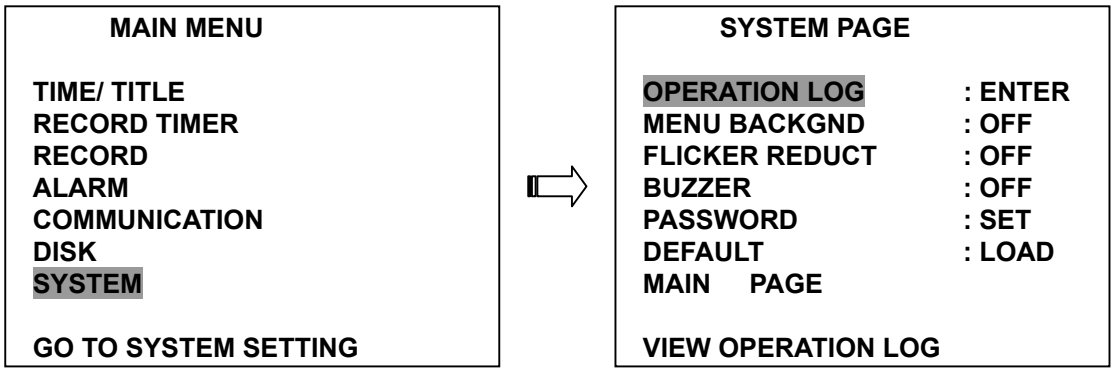
BACKUP:

The BACKUP option is used to duplicate data from HD 1 and HD 2 to HD 3.

(For operation details, please refer to section 4.5.1)

5.7 SYSTEM

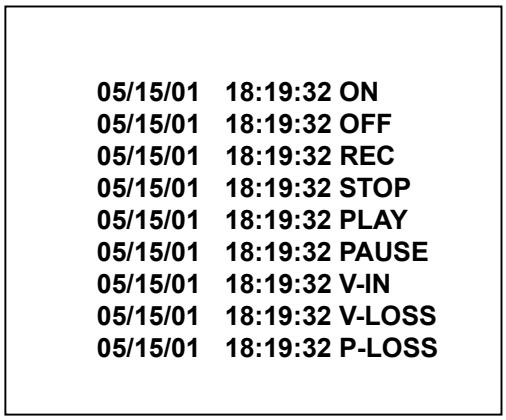
The SYSTEM PAGE is used for accessing the history of operation status, setting the password, resuming factory default, and determining the menu display background.



LOG :

This log shows the history of the operation status in chronological order. The operation status is described to the right of the time of each entry. There are seven possible entries as detailed below.

ON : The device was powered up.
OFF : The device was powered off.
REC : Recording Started.
STOP : Recording stopped.
PLAY : Recorded Video was played back.
PAUSE : The display was paused.
V-IN : Video input was connected.
V-LOSS : Video loss occurred.
P-LOSS : Power interruption occurred.



MENU BACKGND :

The MENU BACKGND option is used for setting the background display of the menus.

ON : Background is blue.
OFF : Background is transparent.

FLICKER REDUCTION :

The FLICKER REDUCTION option is used to eliminate the flickering condition of an image as it occurs during a playback picture by picture. Slight picture degradation may occur when using this feature.

ON : FLICKER REDUCTION is enabled.
OFF : FLICKER REDUCTION is disabled.

BUZZER :

The BUZZER option is used to determine the embedded buzzer sounding a tone to signal the following situations. A tone lasts about two seconds long.

Situation	Status
Alarm	Alarm takes place
Video Loss	Video loss takes place
Disk Full	Disk is full
Load Default	Load factory default
Buzzer	Buzzer set to ON
Key Lock	Enable/disable key lock function
HD3	Power on /off mobile rack HDD
Backup	Backup operation complete
Timer	Timer activate/deactivate
HDD	Recording switching between HDD

ON : BUZZER is enabled.

OFF : BUZZER is disabled.

PASSWORD:

The PASSWORD option is used to set a 4 digit number password to prevent any unauthorized re-formatting of the hard disk drives and to use the network viewer.

OLD PASSWORD : Enter the pre-set password (or the standard password if this is the initial setting) to access the password setting system.

NEW PASSWORD : Enter a 4 digit number password of your choosing which will replace the pre-set password (or the standard password “9999”).

DEFAULT :

The DEFAULT option is used to reload the factory default setting.

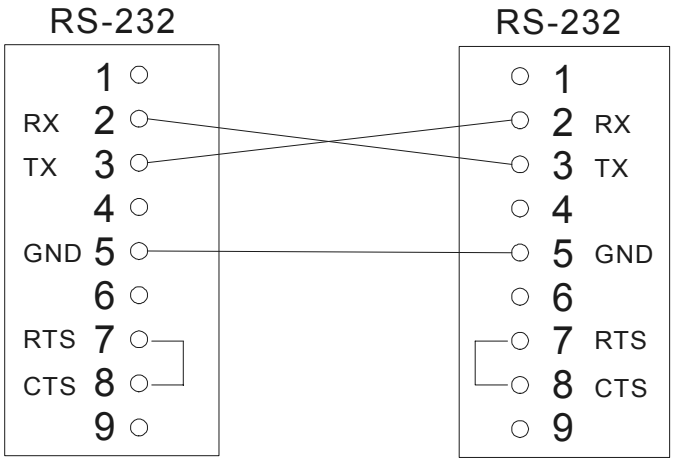
6. SPECIFICATIONS

Image System	**NTSC**	**PAL**
Resolution	**720 x 480 pixels**	**720 x 576 pixels**
Video Input	**BNC x 2, S-Video x 1**	
Video Output	**BNC x 2, S-Video x 1**	
Storage Media	**UP to 3 IDE Hard Disks (One mobile Rack)**	
Image Format	**M-JPEG**	
Critical Image Archiving	**1.44MB FDD**	
Recording Rate	**Up to 60 fields/sec**	**Up to 50 fields/sec**
Image Compression	**High/ Standard/ Basic**	
Recording Mode	**Schedule/ Manual/Alarm/Continuous**	
Pre-Alarm Recording	**Yes**	
Playback Speeds	**Fast Forward /Reverse: 1x, 2x, 4x, 8x, 16x, 30x, Slow Forward/Reverse: 1/2x, 1/4x, 1/8x, 1/16x Picture By Picture Playback**	
Access To Recording	**Full List Search, Time Search, and Event Search**	
Title	**12 Characters**	
On Screen Display & Setup	**Title/ Time/Date/Main Menu**	
Alarm Input	**1 x NO or NC Contact Programmable**	
Alarm Output	**Yes (5V / 0V 5mA max.)**	
Full-Disk Alarm Output	**Yes**	
Trigger Output	**1**	
Operation History Log	**Up to 2016 events**	
Key Lock	**Yes**	
RS-232 port	**Yes**	
Software Upgradeable	**Yes**	
Password Control	**Yes**	
Power Interruption Recovery	**Automatic Restart After Power Interruption /Recording Operation Resume**	
Power Input	**AC 100~240 V Input (50 Hz/60 Hz); 1 A Max**	
Dimensions	**374 x 430 x 90 mm**	
Operation Temperature	**5°~45°C (41°~ 113°F)**	

APPENDIX 1. -- RS-232 Protocol

1.Setup

1.1 Use Null Modem cable (The standard RS-232 9 Pin Cable with Pin 2 and Pin 3 exchanged, see pin configuration chart below for details) to connect the COM 1 on the rear panel of the unit to a PC.



1.2 Set the **RS-232** option to **SLAVE** in the **COMMUNICATION** page of the main menu.

1.3 Set communication parameters: 9600 bps, No Parity, 8 Data Bits, 1 Stop Bit.

2. Communication Protocol:

2.0 General Command Format

<Lead Code = 0x41>, <Main category >, <Second category >, {<Number of parameters>, <Parameter 1>, <Parameter 2> ..,} <End Code= 0x4f>

Lead Code	= 0x41	
Main Category	= 0x01	Keys and Signals
	= 0x02	Command
Second Category	= 0x01	Handshake
	= 0x02	Request Time/Set Time
	= 0x05	Request System State
End Code	= 0x4f	

The different command types and their corresponding parameters are as follows:

2.1 Keys and signals

PC Send: <0x41>, <0x01>, <Key Value>, <0x4f>

< The value for a specific front panel key >

KEY_PLAY	1
KEY_STOP	3
KEY_PAUSE	4
KEY_POWER	5
KEY_REC	6
KEY_SETUP	7
KEY_ENTER	8
SET_DEFAULT	9 (reserved)
KEY_SEARCH	10
KEY_DISPLAY	11
KEY_UP	13
KEY_DOWN	14
KEY_LEFT	15
KEY_RIGHT	16
KEY_SCAN_F	19
KEY_SCAN_R	20
KEY_RETURN	21
KEY_MONITOR	36

2.2 COMMAND Types

2.2.0 Command (Main Category=0x02)

2.2.1 Handshake (Second Category=0x01)

PC Request: <0x41>, <0x02>, <0x01>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x02>, <0x01>, <0x00>, <0x4f>

2.2.2 Request Time (Second Category=0x02)

PC Request: <0x41>, <0x02>, <0x02>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x02>, <0x02>, <0x07>, <7 Time Value >, <0x4f>

The following case is an illustration of **< 7 Time Value>**

2001/06/20 17:05:00 = <0xD1>,<0x07>, <0x06>,<0x14>, <0x11>,<0x05>, <0x00>

2.2.3 Set Time (Second Category=0x02)

PC Request: <0x41>, <0x02>, <0x02>, <0x07>, < 7 Time Value >, <0x4f>

The following case is an illustration of **< 7 Time Value>**

2001/06/20 17:05:00 = <0xD1>, <0x07>, <0x06>, <0x14>, <0x11>, <0x05>, <0x00>

DVR Act: Changing the time and date.

2.2.4 Set Setup Values (Second Category=0x04)

PC Request: <0x41>, <0x02>, <0x04>, <n+1>, <Location>, < Value 1 >, <Value 2>,...,
< Value n>, <0x4f>

For the descriptions of setup value, please see section 2.2.5.

NOTE: This command must be executed in states other than REC, Playback, and Play idle mode. (Refer to 2.2.6)

2.2.5 Request State (Second Category=0x05)

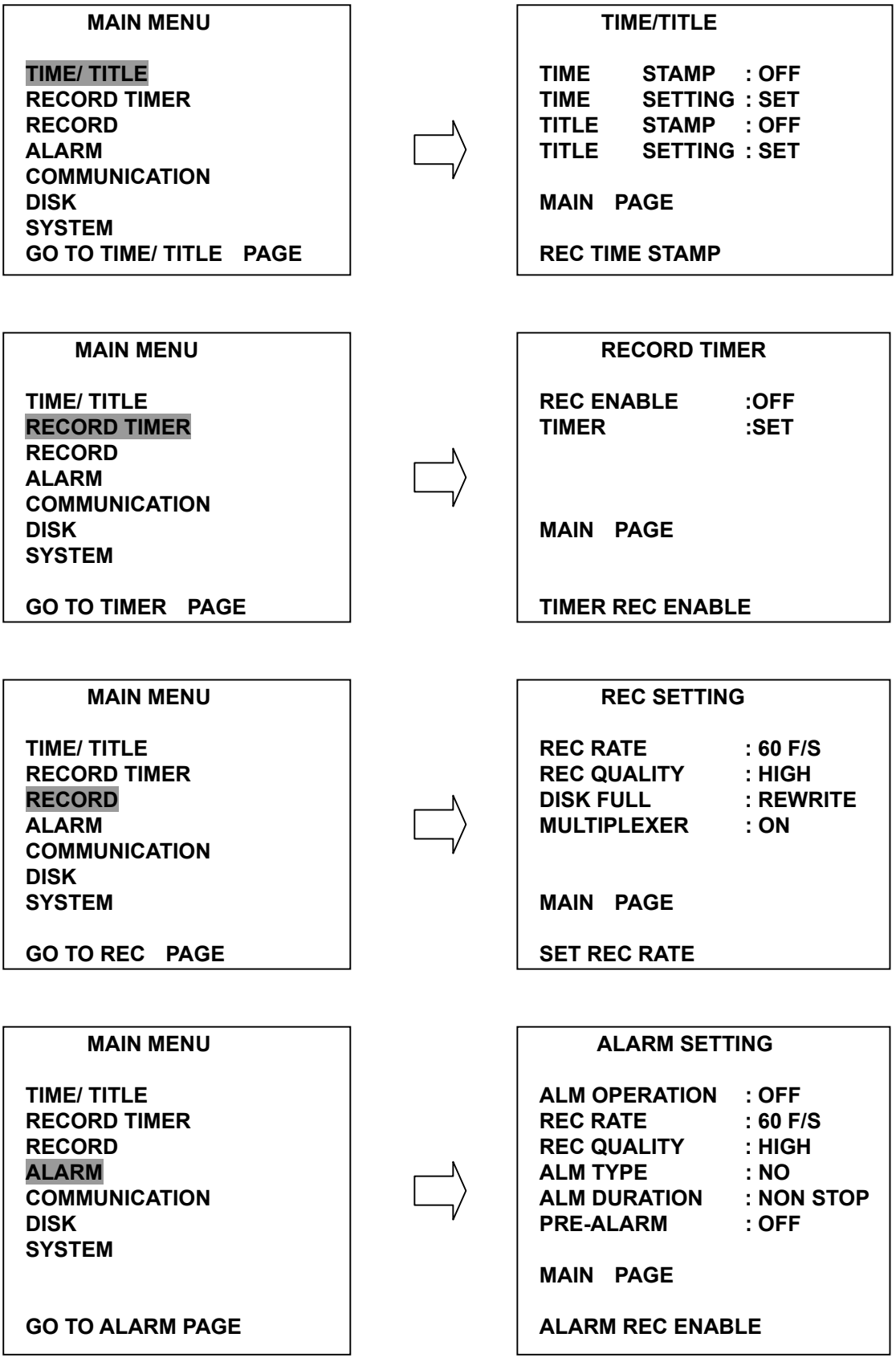
PC Request: <0x41>, <0x02>, <0x05>, <0x00>, <0x4f>

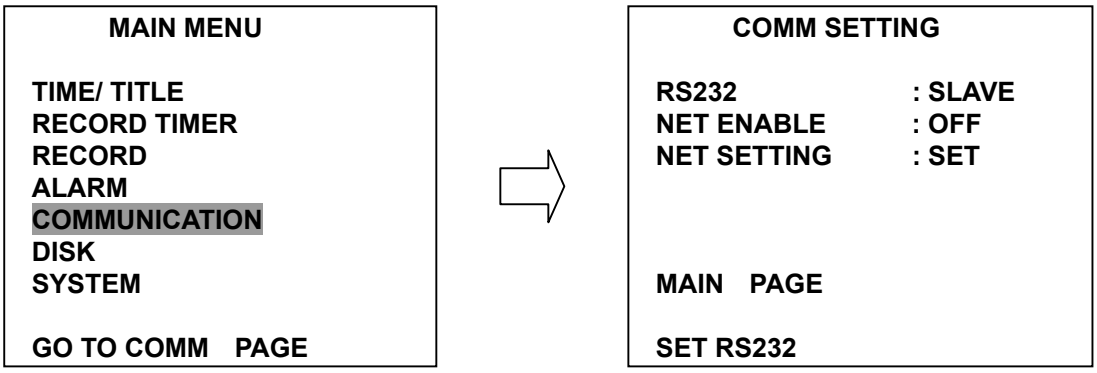
DVR Response: <0x41>, <0x02>, <0x05>, <0x01>, <System State = 0..>, <0x4f>

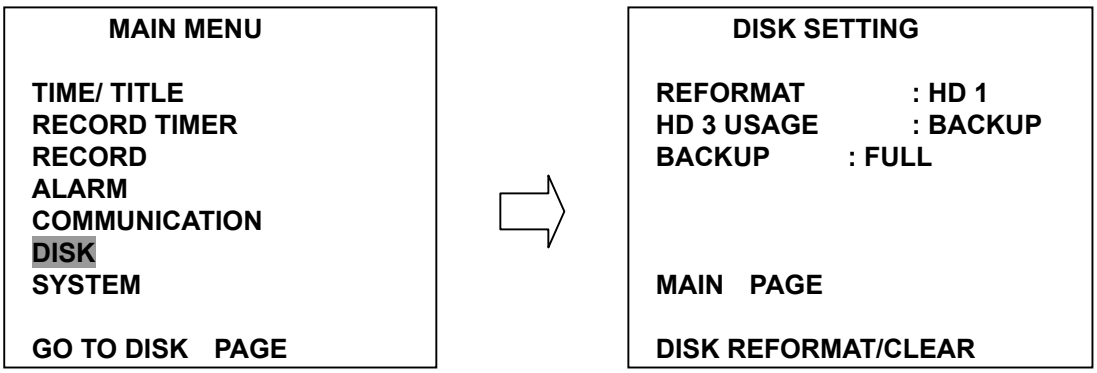
Description of <System State>:

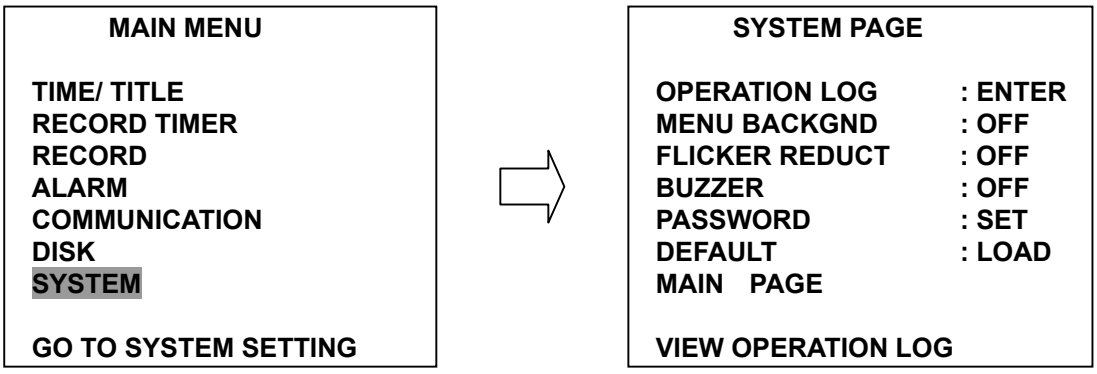
STATE_STOP	0
STATE_REC	1
STATE_PREREC	2
STATE_PLAY	3
STATE_MENU	4
STATE_PLAYIDLE	5
STATE_SETUP	6..16
STATE_SEARCH	7..11
STATE_BACKUP	13..15
STATE_ALARMLIST	17
STATE_LOGLIST	18
STATE_RESTART	21

APPENDIX 2. -- System Default




MAIN MENU
TIME/ TITLE
RECORD TIMER
RECORD
ALARM
COMMUNICATION
DISK
SYSTEM
GO TO COMM PAGE
COMM SETTING
RS232 : SLAVE
NET ENABLE : OFF
NET SETTING : SET
MAIN PAGE
SET RS232


MAIN MENU
TIME/ TITLE
RECORD TIMER
RECORD
ALARM
COMMUNICATION
DISK
SYSTEM
GO TO DISK PAGE
DISK SETTING
REFORMAT : HD 1
HD 3 USAGE : BACKUP
BACKUP : FULL
MAIN PAGE
DISK REFORMAT/CLEAR


MAIN MENU
TIME/ TITLE
RECORD TIMER
RECORD
ALARM
COMMUNICATION
DISK
SYSTEM
GO TO SYSTEM SETTING
SYSTEM PAGE
OPERATION LOG : ENTER
MENU BACKGND : OFF
FLICKER REDUCT : OFF
BUZZER : OFF
PASSWORD : SET
DEFAULT : LOAD
MAIN PAGE
VIEW OPERATION LOG

APPENDIX 3. -- O.S.D Message

No.	O.S.D Message	Meanings
1	**NO DISK**	No hard disk detected after power on
2	**BATTERY LOW**	Suggest user to change battery and set system time
3	**LOADING**	System Boot up
4	**VIDEO LOSS**	Video loss
5	**VIDEO IN n**	Video input source
6	**KEY LOCKED**	Key lock function is on
7	**KEY UNLOCKED**	Key lock function is off
8	**BACKUP n1 / n2 NOW**	During backup operation
9	**BACKUP COMPLETE**	Backup complete
10	**HD3 SPACE NOT ENOUGH**	HD3 has not enough space for backup
11	**NO ENTRY FOR BACKUP**	Nothing can be backup
12	**BACKUP INCOMPLETE**	Backup incomplete, since user press STOP key to stop it
13	**NOT FOUND**	In Time Search function, system can not find the corresponding video
14	**END**	Playback of recorded video reached end point
15	**DISK FULL**	Hard disks are full, it happened only when the DISK FULL item in main menu was set to STOP
16	**EMPTY**	User press PLAY key or use SEARCH function, but no video could be play.
17	**SET TO NTSC, PLS RESTART**	System has be set to NTSC, please reboot (PAL is similar)
18	**SOFTWARE UPDATE**	Software update
19	**PLEASE RESTART**	System should be reboot after software updated
20	**NO DISK**	User press save key without putting in a floppy disk, or disk error
21	**DATA NOT CONTINUOUS**	System finds data in installed HDs cannot be used contiguously. Suggest to remove HD2 and HD3 from system.
22	**DISK ATTACHED**	HD3 was attached
23	**DISK REMOVED**	HD3 was removed
24	**DISK ERROR**	HD3 detected error
25	**HDn ERROR AT xxxxx**	Hard disk error during recording, where n is hard disk number and xxxxx is hexadecimal location.
26	**NOT PRESENT**	When user try to clear a disk (in main menu) that was not attached
27	**SAVE TO DISK**	Start saving JPEG file
28	**SAVE TO Fnnn. JPG**	Save to Fnnn. JPG (where nnn= 0..999)
29	**SAVE OK**	Save JEPG ok
30	**ERROR**	Floppy is protected or error

APENDIX 4. -- NETWORK VIEWING

You can access live images or recorded images from any desktop over a TCP/IP networking environment by supported network viewer of KV-HD01, which is exclusively designed for KV-HD01 users.

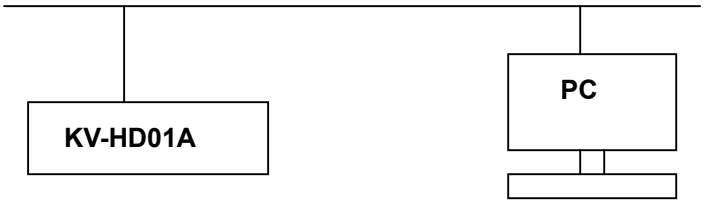
System Requirements

The network viewer can be operated in a PC with the following requirements.

Minimum Intel Pentium 233MHz
32MB RAM
Microsoft Window 95, 98, NT, ME
4 MB Video card capable of 24-bit true color display
5 MB Free Hard-Disk space for software installation
10-base T network card for LAN operation or PSTN/ISDN modem for remote dial-up

Connecting KV-HD01 to your network

Before ready to view images from a desktop, you need to have your KV-HD01 networked. You must obtain a 10 base Ethernet data cable (Standard RJ-45), which the specification is as follows, to connect the KV-HD01 to your LAN/WAN. And then enter the COMMUNICATION in the MAIN MENU to assign an IP address for KV-HD01.



RJ-45 PIN configuration for Ethernet

PIN NO.	PIN Assignment
1.	TX +
2.	TX -
3.	RX +
4.	Not Connected
5.	Not Connected
6.	RX -
7.	Not Connected
8.	Not Connected

Physical specification for Ethernet

Wire Type	Cat. 5
Connector Type	RJ-45
Max. Cable Length	30 M
Hub Wiring Configuration	Straight Through

Browsing image over the network

The Network Viewer can perform the following functions.

- **View live image and still JPEG image.**
- **Play back recorded images.**
- **Save JPEG-image locally.**
- **Change regular record, event record, and Timer properties**

  Please take instructions as follows to install the browsing software and operate it.

1. Install the browsing software to your PC

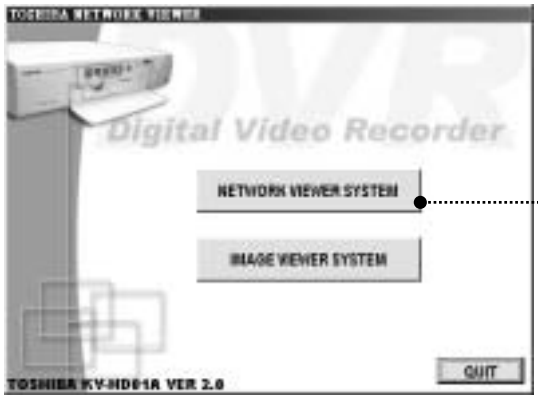
Insert the CD-R comes with the KV-HD01 and follow the onscreen instructions to install it. The browsing software contains two programs, the Network Viewer and the Image Viewer.

NOTE: The settings of display area of a local PC must be set at least 800 x 600 and small font.

2. Open Network Viewer

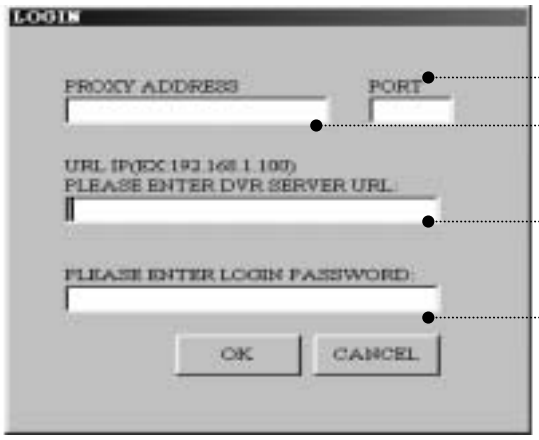
Open the **START** menu, point to **Program, TOSHIBA Network Viewer** and click **Network Viewer**. The dialog box appears as shown in Picture A. Select **Network VIEWER SYSTEM** to show the **LOGIN** dialog box as shown in Picture B. Type IP of the KV-HD01 and password and click OK button. (The password is same as the KV-HD01 set. If you don't set a password for the KV-HD01, the default is 9999)

Picture A



Click to start your Network Viewer.

Picture B



PROXY ADDRESS: Type the address of proxy to use when accesses the Internet using a Proxy sever.
PORT: Type the designated port setting.

Type the IP address of the KV-HD01

Enter the pre-set password of KV-HD01

Viewing Image

If both the IP and password you entered are correct, the network viewer appears as shown below.

QUIT: Click to exit the program at any time.

System status indicators

Green Light: KV-HD01 working normally.

Red Light: KV-HD01 is busy.

HDD 1: Accessed HDD of the KV-HD01

PLAY LIST:

Click on a specific list of the recorded video first and click **SUMBIT**

PgUp & PgUp:

To scroll up and down the list of recorded Video.

STATUS: Indicating the KV-HD01 status.

LIVE: Display live image.

REC: Recording

PLAYBACK: Play back a recorded video.

TIME SEARCH:

Enter a specific time you need to search and click **GO** tab.

Year/Month/Day

Hour/ Minute

STOP: Click to stop a playback or recording.

PLAY: Click to play back a latest recorded video

PAUSE: Click to freeze a play back image.

REC: Click to activate recording function of the KV-HD01

SAVE: Click to save a viewing image into the local computer.

LOGOUT: Click to exit the browsing software.

SETUP: Click to enter the MAIN MENU (Please refer to next paragraph)

Changing The Record & Timer properties

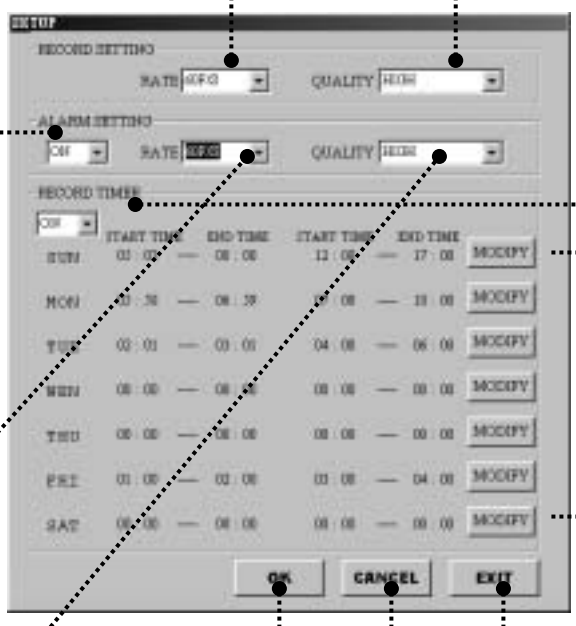
The network viewer allows you to change regular record, event record, and Timer settings of the KV-HD01 over the network.

Changing Record Properties

RATE:
Open the drop-down list to set a desired recording rate, which will change the current recording speed of the KV-HD01.

QUALITY:
Open the drop-down list to set desired image quality, which will change current image quality of the KV-HD01 for recording.

ALARM SETTING:
ON: Enable alarm recording settings.
OFF: Disable alarm recording setting.



RECORD TIMER:
ON: Enable timer recording settings.
OFF: Disable timer recording settings.

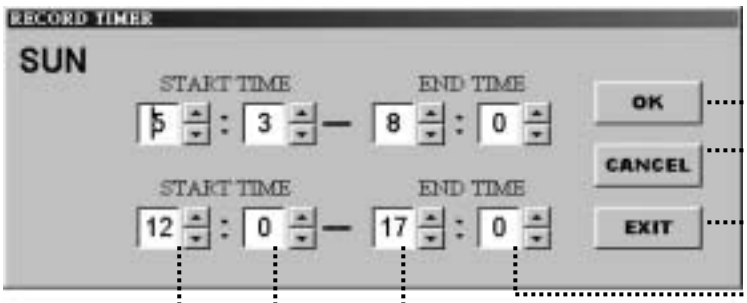
RATE:
Open the drop-down list to choose the desired Recording rate for an alarm event recording.

Click each **MODIFY** tab to set the schedule for recording of each day. Please set Reset Timer to ON first before you click on a **MODIFY** tab. Please refer to the next paragraph for scheduling.

QUALITY:
Open the drop-down list to choose the desired Recording rate for an alarm event recording.

OK: Click to save the settings
CANCEL: Click to resume pre-settings.
EXIT: Click to leave the current page.

Change the Timer properties



OK: Click to save the settings

CANCEL: Click to resume pre-settings.

EXIT: Click to leave the current page.

Set starting hour

Set starting minute

Set ending hour

Set ending minute

Archive Images to the computer

NUMBER OF SAVING:
Set a number of images, which you wish to be saved automatically. Maximum 256 files

SAVE:
Click to save current displayed image into computer.

ABORT:
Click to stop saving images

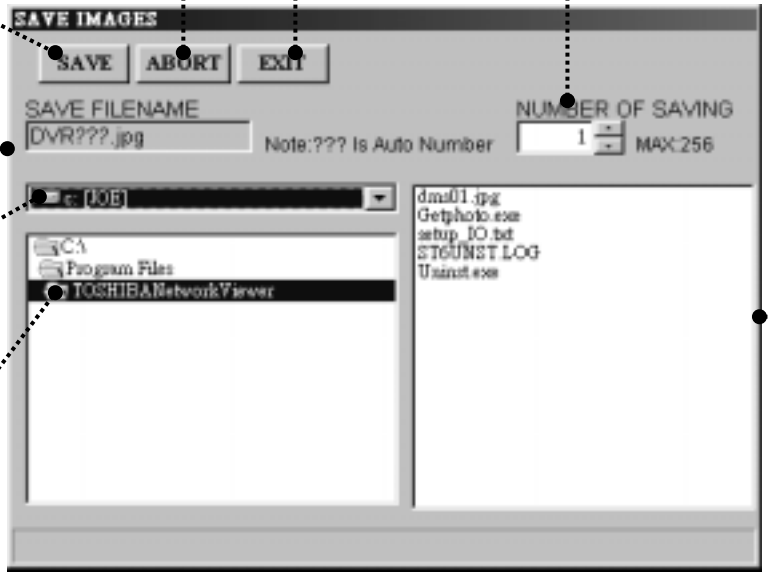
EXIT:
Click to exit the program.

Indicating box of file list kept in the folder.

Indicating box of saved images file name.

Indicating box of accessed drive of the computer.

Indicating box of accessed folder of the computer.



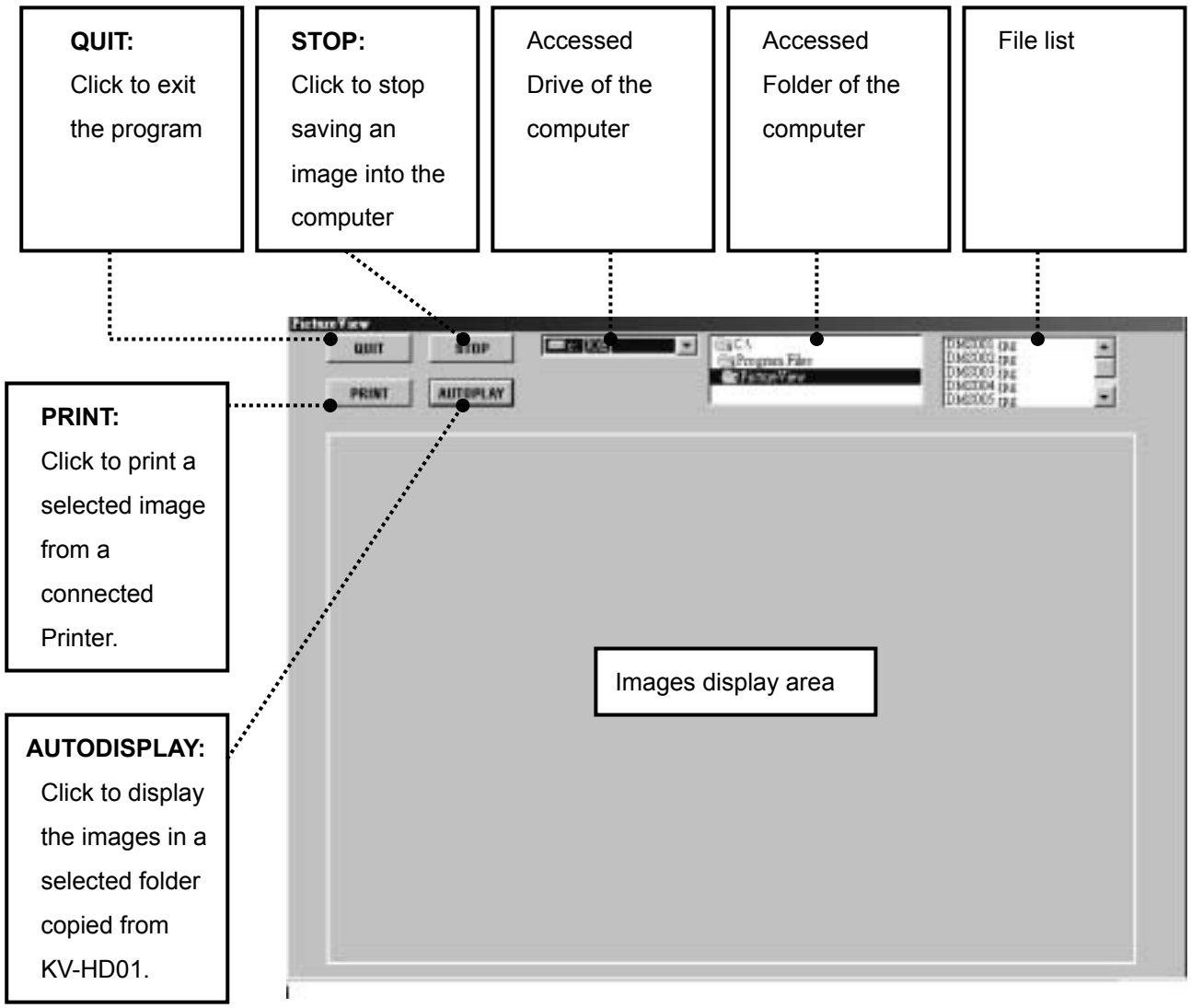
3. Open the Image Viewer

Open the **START** menu, point to **Program**, **Toshiba Network Viewer** and click **Toshiba Network Viewer**. The dialog box appears as shown below. Select **Single Image View System** to start the Image Viewer.

Click to start your Image Viewer.

Viewing a still JPEG-image

This is image integrity-protect software. If an image isn't originally made by a KV-HD01, the Image Viewer will not display image and a message " **Wrong file, Can't open it**" will appear on the screen which will protect archived jpeg images from reproduction and interpolation.



LIMITED WARRANTY
DIGITAL VIDEO RECORDER

Promptly register your product with Toshiba on-line at www.toshiba.com/taisisd. By registering your product you will be eligible for periodic updates, announcements, and special offers applicable for your product. You will have access to extended warranty options, upgrades (as applicable), useful tips, on-line troubleshooting, and the ability to schedule service on-line if necessary. The Imaging Systems Division of Toshiba America Information Systems, Inc. ("ISD") makes the following limited warranties. These limited warranties extend to the Original End-User ("Your[r]").

Limited Two (2) Year Warranty of Labor and Parts

ISD warrants this product and parts against defects in material or workmanship for a period of two years from the date of original retail purchase by the end-user. During this period, ISD will repair or replace a defective product or part with a new or refurbished item. The user must deliver the entire product to an ISD authorized service center. The user is responsible for all transportation and insurance charges for the product to the Service Center. ISD reserves the right to substitute Factory Refurbished Parts and / or Factory Refurbished Product in place of those in need of repair.

Step-by-step Procedures - How to Obtain Warranty Service

[1] Verify operation of the unit by checking the instruction manual and web site for the latest updates at

www.toshiba.com/taisisd

[2] If there is a defect in material or workmanship, schedule service on-line or contact the Digital Support Center for an individual Tracking Number and the location of the nearest ISD authorized service center. To contact technical support call (877) 855-1349.

[3] Arrange for delivery of the product to the ISD authorized service center. Products must be insured and securely packed, preferably in the original shipping carton. A letter explaining the defect and a copy of the bill of sale or other proof of purchase must be enclosed with a complete return street address and daytime telephone number. The Tracking Number should also be indicated on your documents. Charges for transportation and insurance must be prepaid by the end-user.

Your Responsibility, warranties are subject to the following conditions:

[1] You must retain the bill of sale or provide other proof of purchase.

[2] You must schedule service within thirty days after you discover a defective product or part.

[3] All warranty servicing of this product must be made by an ISD authorized service center.

[4] The warranty extends to defects in material or workmanship as limited above, and not to any products or parts that have been lost or discarded by user. The warranty does not cover damage caused by misuse, accident, improper installation, improper maintenance, or use in violation of instructions furnished by ISD. The warranty does not extend to units which have been altered or modified without authorization of ISD, or to damage to products or parts thereof which have had the serial number removed, altered defaced or rendered illegible.

ALL WARRANTIES IMPLIED BY STATE LAW, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THE LIMITED WARRANTIES SET FORTH ABOVE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. WITH THE EXCEPTION OF ANY WARRANTIES IMPLIED BY STATE LAW AS HEREBY LIMITED, THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WITH RESPECT TO THE REPAIR OR REPLACEMENT OF ANY PRODUCTS OR PARTS. IN NO EVENT SHALL ISD BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation may not apply. No person, agent, distributor, dealer, service station or company is authorized to change, modify or extend the terms of these warranties in any manner whatsoever. The time within which an action must be commenced to enforce any obligation of ISD arising under this warranty or under any statute, or law of the United States or any state thereof, is hereby limited to one year from the date you discover or should have discovered, the defect. This limitation does not apply to implied warranties arising under state law. Some states do not permit limitation of the time within which you may bring an action beyond the limits provided by state law so the above provision may not apply to user. This warranty gives the user specific legal rights, and user may also have other rights, which may vary from state to state.

TOSHIBA AMERICA INFORMATION SYSTEMS, INC.
Imaging Systems Division

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